SONY

DIGITAL VIDEOCASSETTE RECORDER

DNW-A75/A75P

BETACAM SX

MAINTENANCE MANUAL Part 2

Volume 1 1st Edition

Serial No. 10001 and Higher: DNW-A75

Serial No. 40001 and Higher: DNW-A75P

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the Maintenance manual part 2 volume 1 of digital videocassette recorder DNW-A75/A75P.

This Maintenance manual part 2 is intended for use by trained system and service engineers, and provides the information that premises the parts level servise (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

This manual (volume 1) explains about parts replacement and guideline for adjustment.

Contents

This Maintenance manual part 2 (volume 1, volume 2, and volume 3) is organized by following sections.

Maintenance manual part 2 volume 1 (9-967-795-)

Section 1 Service Overview

Explains the information of circuit protection devices, NV-RAMs, alignment tapes, extension boards, the removal of PLCC IC, and the service actions after replacing/ repairing the mounted circuit boards.

Section 2 Electrical Alignment

Explains the electrical alignment for the maintenance of this unit.

Section 3 Replacement of Main Parts

Explains the replacement of mechanical parts, power supply unit, and circuit boards.

Section 4 Tape Path Alignment

Explains the tape path alignment after replacement of parts that are described in Section 3.

Section 5 Electrical Alignment after Main Parts Replacement

Explains the electrical alignment associated with replacement of parts that are described in Section 3.

Maintenance manual part 2 volume 2 (9-967-796-)

Section 1 Service Overview
Describes the notes on repair parts.

Section 2 Exploded Views
Describes the exploded views and the mechanical parts list (including some electrical parts) .

Section 3 Electrical Parts List
Describes the electrical parts list of each board (including some mechanical parts) . Moreover, describes the electrical parts list (frame electrical parts list) except on the board.

Section 4 Packing Materials and Supplied Accessories List
Describes the packing materials and the supplied accessories list.

Section 5 Power Cords List
Describes the recommended power cords list.

Section 6 Optional Fixtures List
Describes the optional fixtures and maintenance articles list.

Maintenance manual part 2 volume 3 (9-967-797-)

Section 1 Semiconductor Pin Assignments
Describes the semiconductor pin assignments.

Section 2 Block Diagrams
Describes the block diagrams of overall and each board.

Section 3 Schematic Diagrams and Frame Wiring
Describes the frame wiring and the schematic diagrams for the unit.

Section 4 Board Layouts
Describes the board layouts for the unit.

Related manuals

Besides this “Maintenance manual part 2”, the following manuals are available for digital videocassette recorder DNW-A75/A75P.

- **Operation Manual (Supplied with the DNW-A75/A75P.)**
  This manual is necessary for application and operation (and installation) of the DNW-A75/A75P.

- **Maintenance Manual Part 1 (Supplied with the DNW-A75/A75P.)**
  This manual describes the information that is required to install, maintenance information, and the information for service such as replacement of plug-in boards.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact your local Sony Sales Office/Service Center.

- **Interface Manual of Parallel I/O (50-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the parallel (50-pin). If this manual is required, please contact your local Sony Sales Office/ Service Center.

Trademarks

Trademarks and registered trademarks used in this manual are follows.

• DOLBY is a trademark of Dolby Laboratories Licensing Corporation.

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Section 1
Service Overview

1-1. Circuit Protection Device (Fuse)

Fuses for circuit protection are mounted on the boards of the VTR.
A fuse will melt and break when abnormality occurs and an over-current flows (or over-heat occurs) in the equipment. Be sure to replace it with the specified fuse as shown below after tracing and removing the root of the melt-breaking.

CAUTION

Use the specified part only

The fuse is critical parts to safe operation. Replace these components with Sony parts whose part numbers appear in this manual published by Sony. If not, this may cause a fire or electric shock. Be sure to use the specified component in this manual

Board name	Ref. No.	(address)	Description	Part No.
APR-40 board	PS1200	(F-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
DEC-110 board	PS300	(F-7)	Fuse (chip) 2 A, 125 V	⚠ 1-533-351-11
DPR-118 board	PS11	(G-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
	PS12	(G-7)		
	PS13	(H-7)		
	PS15	(E-7)		
DR-315 board	PS1	(A-5)	Fuse (chip) 5 A, 125 V	⚠ 1-533-275-21
DT-34D board	F1		H. B. C. fuse 1 A, 250 V	⚠ 1-576-225-11
EQ-75 board	PS1	(G-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
SDI-41 board	PS900	(F-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
SS-83 board	PS100	(E-7)	Fuse (chip) 3.15 A, 125 V	⚠ 1-533-266-11
	PS101	(E-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
TBC-23A board	PS1	(C-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
TC-102 board	PS200	(D-1)	Fuse (chip) 0.4 A, 125 V	⚠ 1-533-724-11
	PS300	(D-1)		
VPR-47 board	PS900	(E-7)	Fuse (chip) 5 A, 125 V	⚠ 1-533-275-21

Note: (address) means the mounted address of fuse.

1-2. Memory IC with Backup Battery

Memory IC (RAM, IC710) with backup battery is used on the SS-83 board.
This IC is used to store the setting data of setup menu, etc. Besides it has an RTC (Real Time Clock) function, which is also used in the VTR.
Owing to this battery, even if the external power is cut off, this IC can maintain the stored data and the RTC continues operating.
However, if the battery life comes to end with the external power was cut off, memory can not maintain the stored data and the RTC is failing to function.

Backup battery

Use the following specified parts when replacing.
Replacement way is described in Section 2-16 of the maintenance manual Part 1.
Replacement part : BT710 / SS-83 board
Name : M4T28-BR12SH1 (lithium battery)
Part No. : 8-749-010-67
Recommended time of replacemant :
Every seven years

Replacement time

When life-ending the battery while the VTR is powered off, the RTC is failing to function.
If powered on in such a condition, the error code 96, sub error message “CALENDAR CLOCK” will be displayed. This message is displayed, be sure to replace the backup battery.

Note

- This sub error message is displayed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector with the CHARACTER switch turned on.
  Other sub error messages, if present, are also displayed together.
- When the error code 96, sub error message “CALENDAR CLOCK” is displayed, the date in the calendar will be reset to 1/Nov. 1996.
  You can check the date in calendar/clock using the error logger display mode (M2 : ERROR LOGGER) in the maintenance mode.

Note

When the backup battery is replaced, perform the same setting change as IC710 on the SS-83 board is replaced. Refer to “1-3. NV-RAM” for details.

1-3. NV-RAM

There are the NV-RAMs (EEP-ROM, and RAM with backup battery) and EVR ICs used on the boards in the VTR. These devices store the adjustment data, various setting data for the VTR, data for the hours meters and error log respectively, etc.

EEP-ROM: Electric Erasable P-ROM
EVR: Electric Variable Resister (D/A converter with EEP-ROM)

After replacing above-mentioned device, take the following service actions.
“Service action after replacing” and “Stored data” are listed on next page.
IC710 on the SS-83 board is the only NV-RAM with backup battery.

Note

After replacing the NV-RAM, the error (error code 95, 96, 97, or 98) will occur at power-on.

After replacing IC1/RM-179:	Occurs Error code 95.
After replacing IC710/SS-83:	Occurs Error code 96.
After replacing IC9/MS-58:	Occurs Error code 97.
After replacing IC908/DM-89:	Occurs Error code 98.
After replacing IC900/EQ-75:	Occurs Error code 98.
After replacing IC200/TBC-23A:	Occurs Error code 98.

When replacing IC710 on the SS-83 board and IC1 on the RM-179 board, the error will not occur at the second power-on and later.

Board / Ref.No.	Type	Stored data	Service action after replacing
DEC-110 / IC112	EVR IC	Adjustment data for DEC-110 board	Readjust the DEC-110 board (Video input system). (Perform Section 2-9.)
DM-89 / IC908	NV-RAM	Adjustment data for DM-89 board	Readjust the DM-89 board (Analog Betacam PB system). (Perform Sections 2-11-2 to 2-11-19.)
EQ-75 / IC900	NV-RAM	Adjustment data for EQ-75 board	Readjust the EQ-75 board (RF system). (Perform Section 2-6.)
MS-58 / IC9	NV-RAM	Adjustment data for servo system	After the initialization, readjust the servo system. (Refer to Section 2-5.)
		Hours meter data	None (All data are lost and automatically initialized to count zero.)
		Serial No.	Set by the menu M31 of the maintenance mode.
		Head room of the audio level meter	Set by the menu M37 of the maintenance mode. (When setting it to except 20 dB.)
		Setting data of ISR	Reset by the menu M39 of the maintenance mode.
RM-179/IC2	NV-RAM	Setting data of 50-pin remote	Reset by the menu M32 of the maintenance mode.
SDI-41 / IC457	EVR IC	Adjustment data for SDI-41 board	Readjust the SDI-41 board (SDI input/output system). (Perform Section 2-11.) When the optional board is installed, also readjust the SDTI input/output system. (Perform Section 2-11.)
SS-83 / IC710	NV-RAM	Setting data of setup menu	Set the setup menu again.
		Error logs data	None (All data are lost.)
		ID code data	Set by the ISR (Interactive Status Reporting) application software.
		Calendar/clock	Set the calendar and clock again. (Refer to “4-3. Error Logger display mode” of the maintenance manual Part 1.)
TBC-23A / IC200	NV-RAM	Adjustment data for TBC-23A board	Readjust the TBC-23A board (Analog Betacame PB system). (Perform Sections 2-11-2, 3, 24, 25 and 28.)
VPR-47 / IC909	EVR IC	Adjustment data for VPR-47 board	Readjust the VPR-47 board (Video system). (Perform Section 2-8.)

Refer to Section 4 of the maintenance manual Part 1 for the menu of the maintenance mode.

1-4. PLCC IC Removal

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.

Tool required

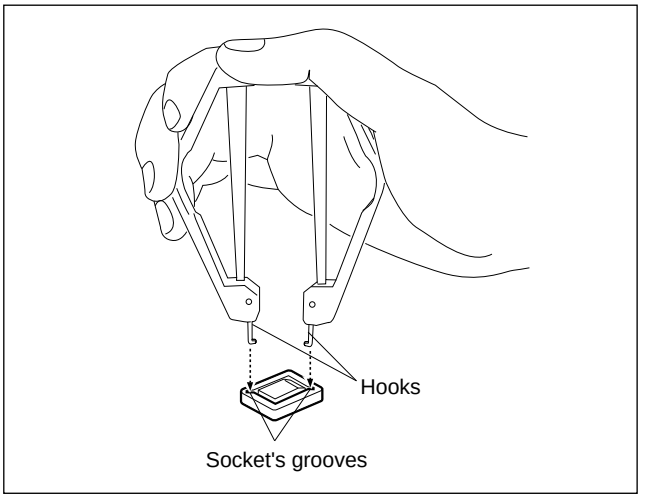
Description: IC extraction tool for PLCC socket
SONY Part No. J-6035-070-A
This tool can be used for IC whose pins number are 20 to 124.

Procedure

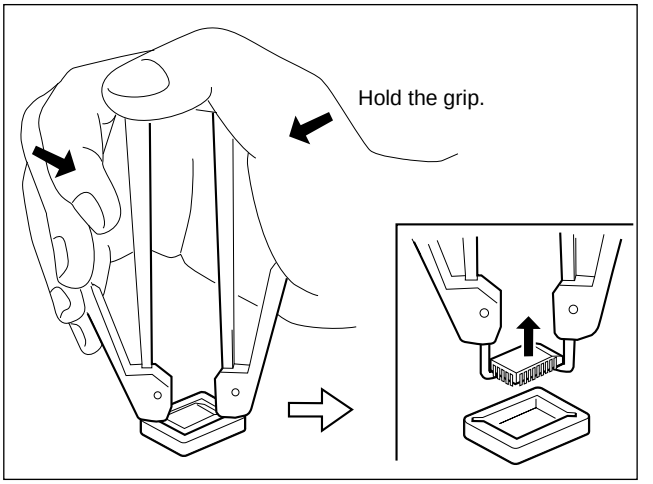
Notes

- Do not pull the IC upward using a hook of the extraction tool.
- Do not interpose the tool by excessive force.

1. Fit the tool's hooks in the grooves of IC socket.



2. Hold the grip as shown in the figure.
   Then holds IC with hooks, and removes it from the socket.
3. Lift up the tool softly with IC nipping.



1-5. Alignment Tape

Describes the alignment tapes used for adjusting the unit.

1. SR5-1 (SONY part No. 8-960-075-01): For 525/60 system
SR5-1P (SONY part No. 8-960-075-51): For 625/50 system

Used for video/audio adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100 % color-bar	–∞ dB FS	CTL
6:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100 % color-bar	–∞ dB FS	CTL
26:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL

2. SR2-1 (SONY part No. 8-960-075-11) :For 525/60 system
SR2-1P (SONY part No. 8-960-075-61) :For 625/50 system

Used for servo adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
00:00-	3.212 MHz (A CH only)	SR2-1: 3 kHz, 0 VU	CTL
(Pulse*)		SR2-1P: 3.15 kHz, 0 VU	
15:00 -	A CH : 3.212 MHz	SR2-1: 3 kHz, 0 VU	CTL
	B CH : 6.424 MHz	SR2-1P: 3.15 kHz, 0 VU	
20:00 -	12.848 MHz (All CH)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P: 3.15 kHz, 0 VU	
25:00 - 27:00	100 % color-bar (All CH)	No signal	CTL

*: The time code data is not recorded on the time code track during pulse portion (00:00 to 15:00). This portion is recorded the duty 7:3 pulse on the CTL track. Therefore, when playing back this portion, time data which is interpolated by the time code signal is displayed.

3. CR2-1B (SONY part No. 8-960-096-01) : For analog Betacam, NTSC
CR2-1B PS (SONY part No. 8-960-096-51) : For analog Betacam, PAL

Used for tracking adjustment.

Time (min. : sec.)	Video Track	AFM	LAU track	CTL track
00:00 -28:00 (Pulse*)	Y : 4 MHz C : 5 MHz	No signal	No signal	CTL

*: The time code data is not recorded on the time code track of this tape. But the duty 7:3 pulse is recorded on the time code track. Therefore, when playing back this tape, time data which is interpolated by the CTL signal is displayed.

4. CR5-1B (SONY part No. 8-960-096-41): For analog Betacam, NTSC
CR5-1B PS (SONY part No. 8-960-096-91): For analog Betacam, PAL

Used for Betacam video/audio adjustment.

Time (min. : sec.)	Video	AFM	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60 % H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60 % multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50 % bowtie & 12.5T CR5-1B PS: 50 % bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75 % color-bar with Drop-out CR5-1B PS: 100 % color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

5. CR5-2A (SONY part No. 8-960-097-44): For analog Betacam, NTSC
CR5-2A PS (SONY part No. 8-960-098-44): For analog Betacam, PAL

Used for Betacam video adjustment.

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75 % color-bar	No signal	CTL
3:00 -	60 % multi-burst	No signal	CTL
6:00 -	CR5-2A: 50 % bowtie & 12.5T CR5-2A PS: 50 % bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

6. CR8-1A (SONY part No. 8-960-097-45): For analog Betacam, NTSC
CR8-1A PS (SONY part No. 8-960-098-45): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, –10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0 VU	No signal

7. CR8-1B PS (SONY part No. 8-960-096-86): For analog Betacam, PAL

Used for Betacam audio adjustment.

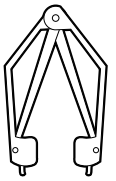
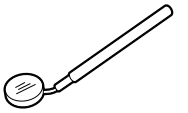
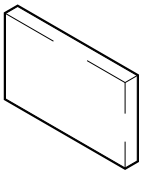
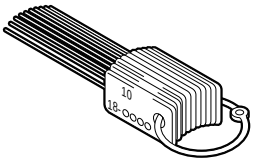
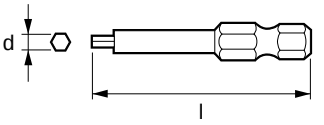
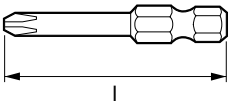
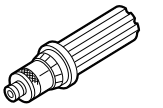
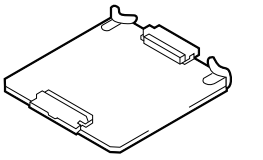
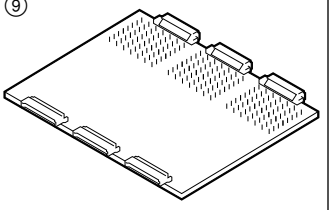
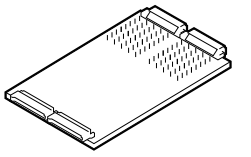
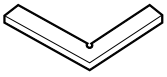
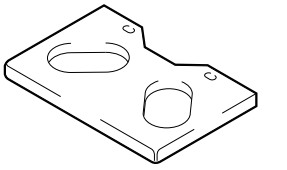
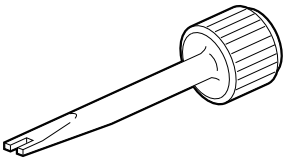
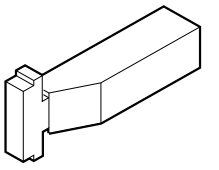
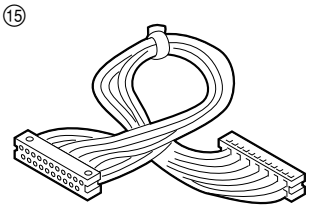
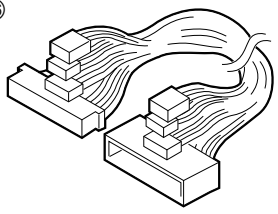
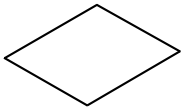
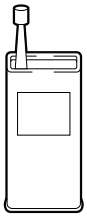
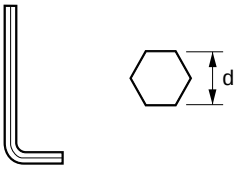
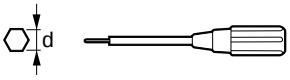
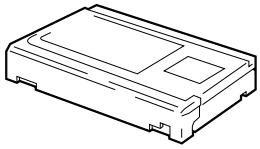
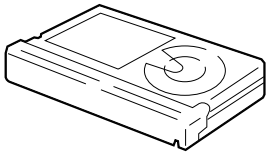
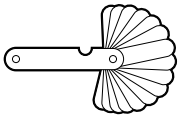
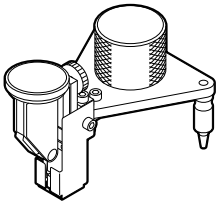
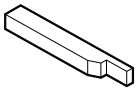
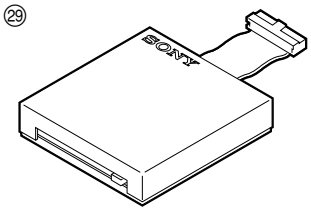
Time (min. : sec.)	LAU tracks	CTL track	Video	AFM
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal	No signal
2:55 -	No signal	CTL	No signal	No signal
3:00 -	15 kHz sine wave, 0 VU	CTL	No signal	No signal
4:55 -	No signal	CTL	No signal	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal	No signal
5:55 -	No signal	CTL	No signal	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal	No signal
6:25 -	No signal	CTL	No signal	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal	No signal
6:55 -	No signal	CTL	No signal	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal	No signal
7:25 -	No signal	CTL	No signal	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal	No signal
7:55 - 8:00	No signal	CTL	No signal	No signal

1-6. Fixtures and Adjustment Equipment List

1-6-1. Fixtures

Note
The tools that are used only in the maintenance manual part 1 are also described.

Fig. No.	Part No.	Description	[Inscription No.]	For use
①	J-6035-070-A	Extraction tool (for PLCC socket)	—	Extraction of IC (PLCC type)
②	J-6080-029-A	Small dental mirror (round type ø12)	—	Cassette pillar height adjustment, tape path adjustment
③	J-6086-570-A	Reference flat plate	[SL-657]	AT head zenith adjustment
④	J-6152-450-A	Wire clearance check gauge set	—	Clearance check
⑤	J-6251-090-A	Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm)	—	Tightening screws to fix a drum assembly and upper drum asssembly
	J-6323-440-A	Torque screwdriver's hexagonal bit (d=0.89 mm, l=50 mm)	—	Tightening screws to fix a M gear
⑥	J-6323-420-A	Torque screwdriver's bit (+2 mm, l=75 mm)	—	Tightening screws to fix a brush/slip ring assembly
	J-6323-430-A	Torque screwdriver's bit (+3 mm, l=90 mm)	—	Tightening screws to fix a reel motor assembly or a ring roller
⑦	J-6252-510-A	Torque screwdriver (6 kg•cm)(0.6 N•m)	[JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kg•cm)(1.2 N•m)	[JB-5252]	Tightening screws
⑧	J-6269-810-A	Extension board (S), EX-377	—	Extension of the small-sized plug-in board (DM, TBC)
⑨	A-8277-211-A	Extension board (L), EX-555	—	Extension of the large-sized plug-in board
⑩	A-8277-212-A	Extension board (S), EX-556	—	Extension of the small-sized plug-in board (EQ, AU, SDI, DEC)
⑪	J-6320-870-A	Reel motor shaft slantness check fixture	[MW-087]	Reel motor shaft slantness adjustment
⑫	J-6320-880-A	Cassette reference plate (L)	[MW-088]	Reel table height adjustment, Reel motor shaft slantness adjustment
⑬	J-6322-610-A	Tape guide adjustment driver	[MW-261]	Tape path alignment
⑭	J-6329-350-A	Reel table height gauge	[MW-935]	Reel table height adjustment
⑮	1-952-684-11	Extension cable (14P)	—	Extension of the TBC-23A or TBC-24 board
⑯	A-8321-333-A	Power cable assembly	—	Extension of the power supply unit
⑰	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	—	Cleaning
⑱	7-432-114-11	Locking compound (200 g)	—	Inhibits loosening of screws
⑲	7-661-018-18	Diamond oil NT-68 (50 ml)	—	
⑳	7-651-000-10	Sony grease SGL-601 (50 g)	—	
㉑	7-700-736-01	L-shaped hexagonal wrench (d=1.27 mm)	—	
	7-700-736-04	L-shaped hexagonal wrench (d=2.5 mm)	—	
	7-700-736-05	L-shaped hexagonal wrench (d=1.5 mm)	—	
	7-700-736-06	L-shaped hexagonal wrench (d=0.89 mm)	—	
㉒	7-700-766-04	Hexagonal wrench driver (d=2.5 mm)	—	
㉓	8-960-075-01	Alignment tape, SR5-1	—	Video/audio alignments (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	—	Servo alignments (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	—	Video/audio alignments (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	—	Servo alignments (for 625/50 system)
㉔	8-960-096-01	Alignment tape, CR2-1B	—	Tracking adjustment (for analog Betacam NTSC)
	8-960-096-41	Alignment tape, CR5-1B (metal particle tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-096-51	Alignment tape, CR2-1B PS	—	Tracking adjustment (for analog Betacam PAL)
	8-960-097-44	Alignment tape, CR5-2A (oxide tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-097-45	Alignment tape, CR8-1A (oxide tape)	—	Audio alignments (for analog Betacam NTSC)
	8-960-096-91	Alignment tape, CR5-1B PS (metal particle tape)	—	Video alignments (for analog Betacam PAL)
	8-960-096-86	Alignment tape, CR8-1B PS (metal particle tape)	—	Audio alignments (for analog Betacam PAL)
	8-960-098-44	Alignment tape, CR5-2A PS (oxide tape)	—	Video alignments (for analog Betacam PAL)
	8-960-098-45	Alignment tape, CR8-1A PS (oxide tape)	—	Audio alignments (for analog Betacam PAL)
㉕	9-911-053-00	Thickness gauge	—	Clearance check
㉖	9-919-573-01	Cleaning liquid	—	Cleaning
㉗	J-6332-240-A	VISC phase adjusting tool	—	VISC alignment for PAL system
㉘	J-6530-650-A	Head tip protruction measurement gauge	—	Head tip protrusion check of the video heads
㉙	J-6190-800-A	Tension regulator slantness check tool	[BW-080]	Slant guide slantness adjustment
㉚	A-8319-485-A	IC memory card box, CDS-20 assembly	—	Software update

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1-6-2. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as a standard product.

Equipment	Model name	Remarks
Analog composite video signal generator (with GENLOCK mode)	Tektronix 1410	(For 525/60 system)
	Tektronix 1411	(For 625/50 system)
Analog composite video signal generator	Tektronix TSG-170A	(For 525/60 system)
	Tektronix TSG-271A	(For 625/50 system)
Analog component video signal generator	Tektronix TSG-300	For generating SMPTE/EBU format analog video signal (For DNW-A75)
	Tektronix TSG-371	For generating SMPTE/EBU format analog video signal (For DNW-A75P)
Digital component video signal generator	Tektronix TSG-422 (OP.1S)	For generating 4:2:2 format digital signal
Spectrum analyzer	Advantest R3261A	With external trigger function Bandwidth: more than 100 MHz
Oscilloscope	Tektronix 2465B	
Analog component waveform monitor	Tektronix WFM300 or WFM300A	For measuring analog component video levels
Serial component waveform monitor	Tektronix WFM601	
Analog composite waveform/vector monitor	Tektronix 1750 or 1780R	For measuring analog composite SC-H (For 525/60 system)
	Tektronix 1751 or 1781R	For measuring analog composite SC-H (For 625/50 system)
Audio signal generator	Tektronix SG505 (OP.02)	
Audio analyzer	Tektronix AA501A (OP.02)	For measuring levels (dBm), distortion, and dB ratio
Audio level meter	Hewlett-Packard HP3400A	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
Monitor with serial digital input	Sony BVM-1311 (with optional accessory BKM-2085-14)	(For DNW-A75)
	Sony BVM-1411 (with optional accessory BKM-2085-14)	(For DNW-A75P)
Network analyzer	Anritsu MS420B	
Time code generator	Sony BVG-1600	(For 525/60 system)
	Sony BVG-1600PS	(For 625/50 system)
Time code reader	Sony BVG-1500	(For 525/60 system)
	Sony BVG-1500PS	(For 625/50 system)
Terminator	—	75-ohm, BNC type
BNC T adapter	—	75-ohm
Recording tape	Sony BCT-SX series	Cassette tape for Betacam SX

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1-7. Internal Video Test Signal

VTR has the internal video test signal generator.
There are two ways to generating the test signal with this generator.

- Setup extend menu
  ITEM-710 : INTERNAL VIDEO SIGNAL GENERATOR
  For detail, refer to “7-3. Extend Menu” of the operation manual.
- Maintenance mode
  C21 : VIDEO TEST SG
  For detail, refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual Part 1.

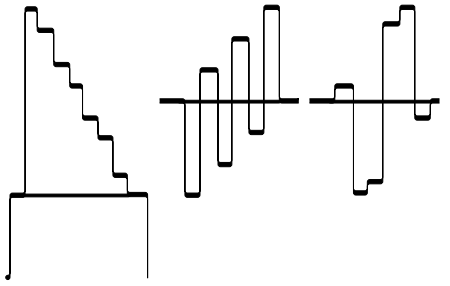
Describes output waveform figures of this generator below. They figures are drew from waveforms that are watched COMPONENT OUT with the waveform monitor. They are measured with H rate and displayed with PARADE unless otherwise specified.

Note

In the 525/60 system, when selecting either D-1 format or Betacam format, set by the setup extend menu ITEM-709 : CAV LEVEL FORMAT, SUB-ITEM 0 : OUTPUT CAV LEVEL.
In the 625/50 system have no Betacam format.

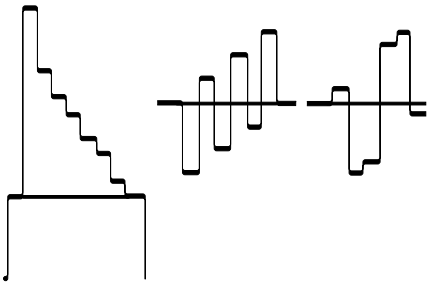
100% Color Bars

D-1 format

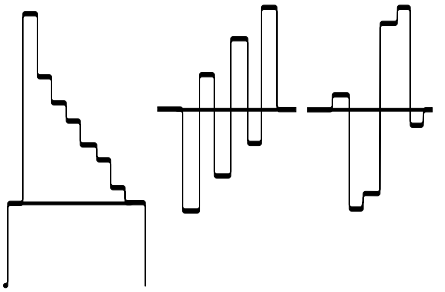


75% Color Bars

D-1 format

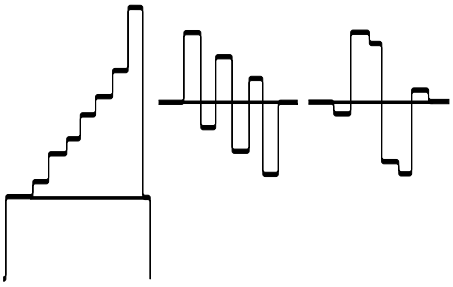


Betacam format

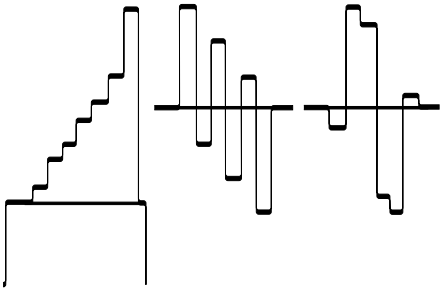


75% Reverse Color Bars

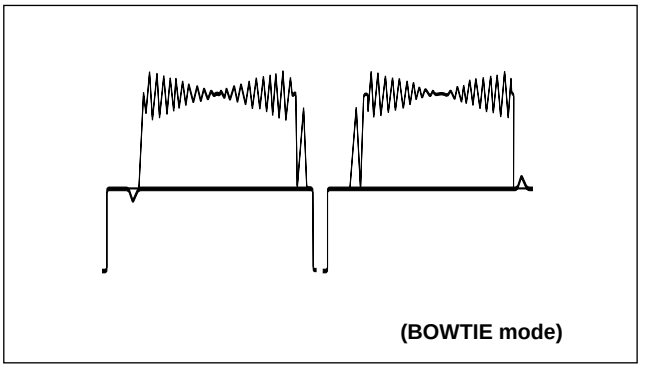
D-1 format



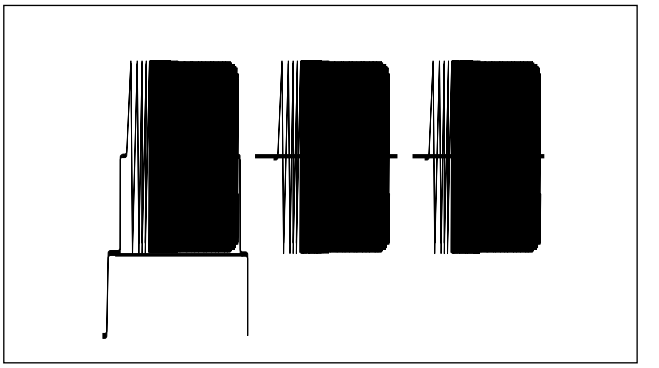
Betacam format (525/60 system only)



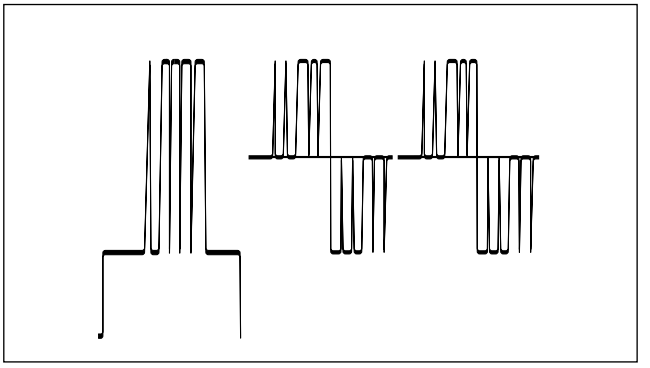
Bowtie



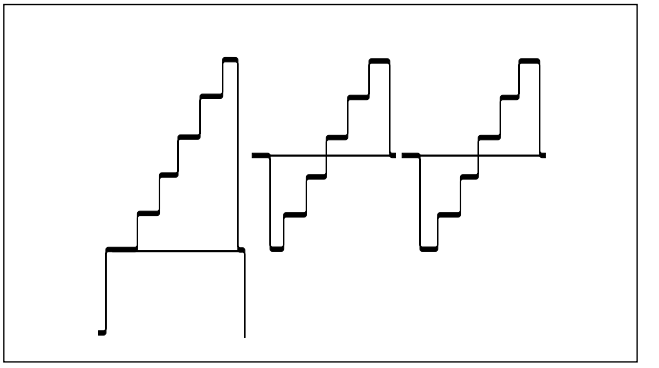
H Sweep



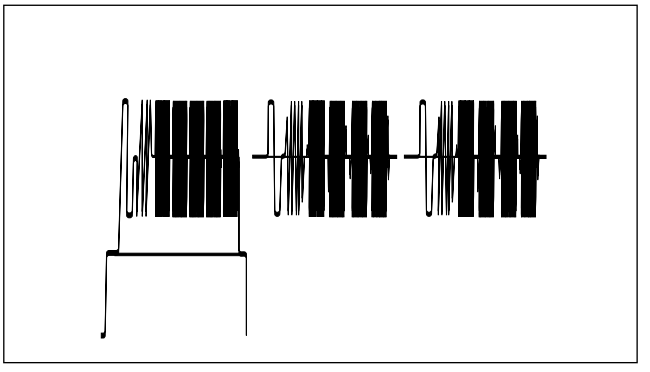
Pulse and Bar



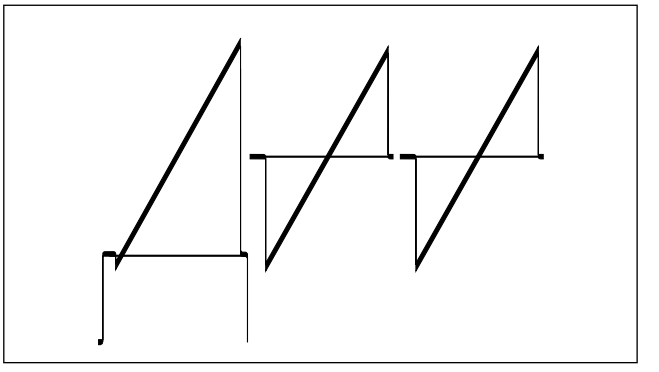
5 step



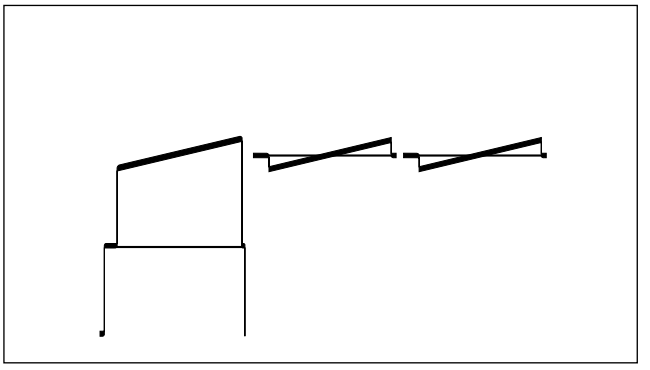
Multi Burst



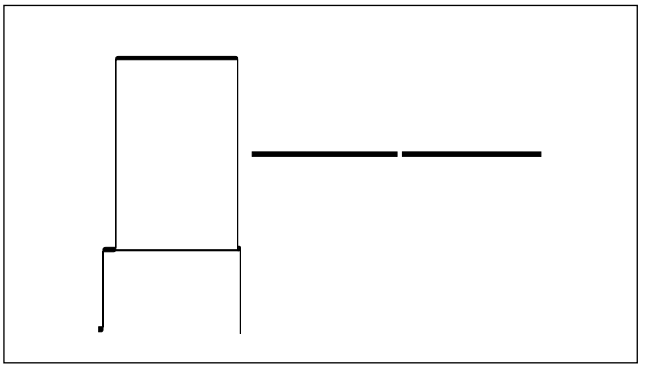
Ramp



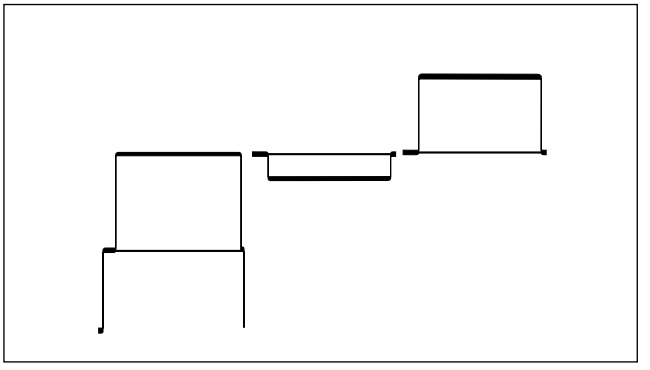
Shallow Ramp



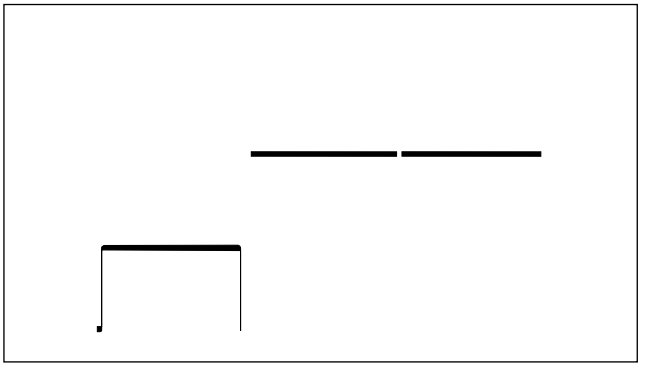
100% Flat



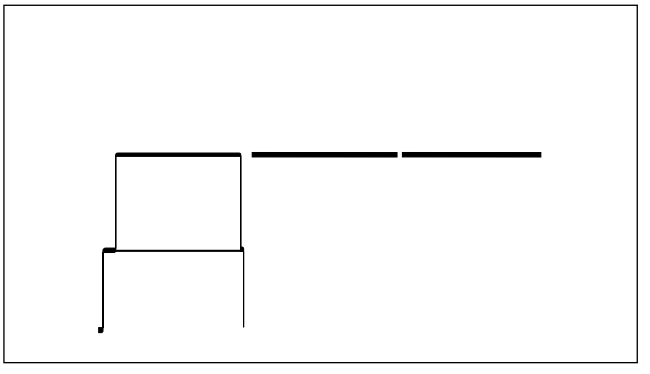
Red Signal



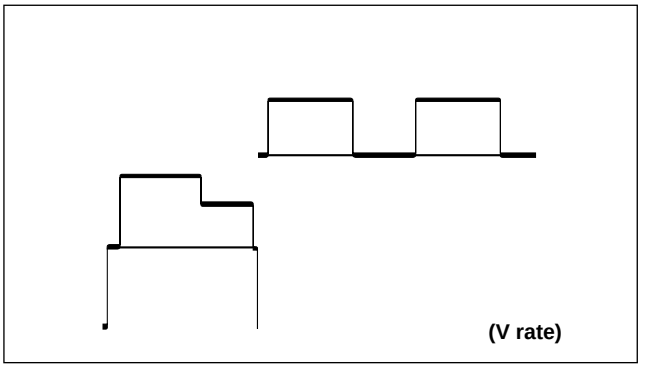
Black Burst



50% Flat

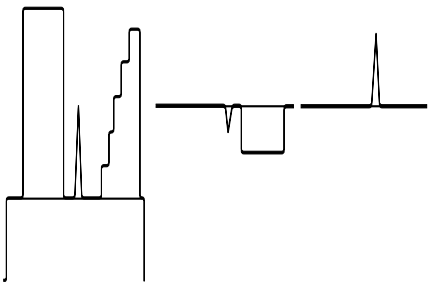


Pathological Check Code

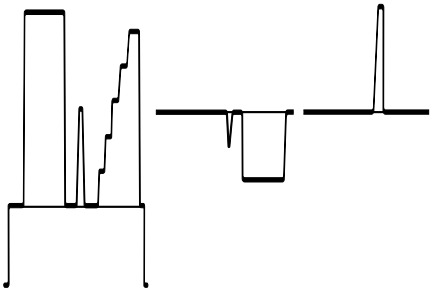


NTC7 (NTSC) (525/60 System only)

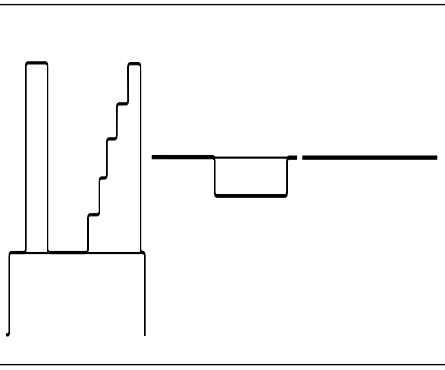
D-1 format



Betacam format



Line330 (625) (625/50 System only)



1-8. Extension Board

Extension board to extend the plug-in board is available in three types.

For Large Plug-in Board

Description: Extension board (L), EX-555
SONY part No.: A-8277-211-A

For Small Plug-in Board

For the small plug-in board is available in following two types.

1. For AU-260, DEC-110, EQ-75, and SDI-41 boards

Description: Extension board (S), EX-556
SONY part No.: A-8277-212-A

2. For DM-89 and TBC-23A/24 boards

Description: Extension board (S), EX-377
SONY part No.: J-6269-810-A

1-9. Service Action after Replacing or Repairing the Board

After replacing or repairing the mounted circuit board in this VTR, be sure to perform the following adjustment or the function check.
Moreover, when the SS-83 board is replaced, it is required to check the setting.

Note

When using the menu of the setup or maintenance mode, connect the analog composite video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1-9-1. AC-169 Board

After replacing or repairing this board, turn the power on and check that the power is correctly applying to the VTR by the rotation of fan motor or condition of indicator.

1-9-2. APR-40 Board

After replacing or repairing this board, perform the audio system alignment (Sections 2-7-3 to 2-7-5).

1-9-3. AU-260 Board

After replacing or repairing this board, perform the LAU/AFM PB system adjustment (Sections 2-7-6 and 2-7-7).

1-9-4. CCM-15 Board

For the threading motor

After replacing or repairing this board, check the functions of the threading motor using C012 : THREADING MOTOR in the maintenance mode.

(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

For the reel position motor

After replacing or repairing this board, check the functions of the reel shift motor using C016 : REEL POSITION MOTOR in the maintenance mode.

(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

Note

Since the mounted CCM-15 board is out of service part, prepare the plain CCM-15 board and the components of the CCM-15 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-9-5. CL-29 Board

After replacing or repairing this board, check that the compartment block in the cassette compartment moves up and down normally using C013 : CASSETTE COMP MOTOR. of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-6. CP-278 Board

After repairing this board, perform the following checks.

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505 option-02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Set AUDIO SELECT to “INPUT” and select “ANALOG”.
2. Perform the following check for each channel.
   (1) Set the analog audio input level switch to “600 Ω”.
   (2) Input the audio signal of 1 kHz +4.0 dBm (600 Ω) to AUDIO INPUT connector from the signal generator.
   (3) Check that the audio level at AUDIO OUTPUT connector is 4.0 ±0.5 dBm by the audio analyzer.
   (4) Return the analog audio input level switch to the customer setting.

1-9-7. CP-301 Board

After repairing this board, perform the following checks.

Preparing tools

- Time code generator:
  525/60 system: SONYBVG-1500 or equivalent
  625/50 system: SONY BVG-1500PS or equivalent
- Time code reader
  525/60 system: SONY BVG-1600 or equivalent
  625/50 system: SONY BVG-1600PS or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Connect the time code generator to TC IN connector, and the time code reader to TC OUT connector.
2. Set the upper control panel as follows:
   TC/AUTO/VISC: LTC
   INT/EXT: EXT
   PRESET/REGEN: PRESET
3. Check that the reader can read correctly the time code from the generator.
4. Return the above switches in the upper control panel to the customer settings.
5. To generate the test signal within VTR, select “1KHz SINE 0VU” using C23 : AUDIO TEST SG of the maintenance mode.
   (Refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.)
6. Check that the audio level at MONITOR OUTPUT L connector is 4.0 ±0.5 dBm by the audio analyzer.
7. Check that the audio level at MONITOR OUTPUT R connector is 4.0 ±0.5 dBm by the audio analyzer.
8. Exit the maintenance mode.

1-9-8. CP-334 Board

Perform the following check after replacing or repairing this board.

Preparing tools

- Analog composite video signal generator:
  TEKTRONIX TSG-170A or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent
- Analog composite waveform monitor
  DNW-A75: TEKTRONIX 1750, 1780R, or equivalent
  DNW-A75P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor
  Used for displaying of the menu. Usually, connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (4 peices.)

Preparations

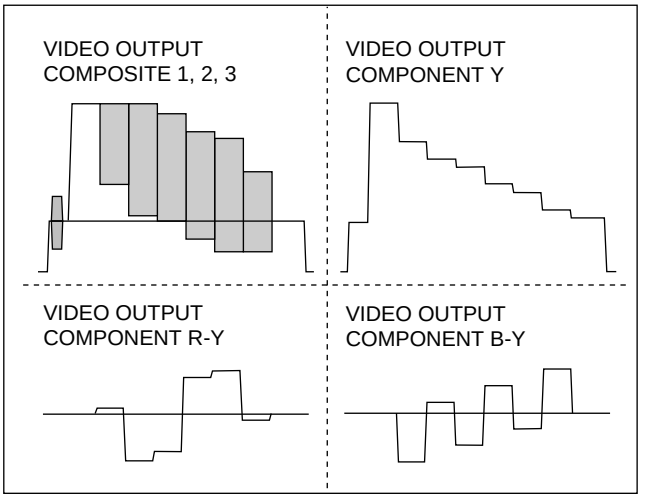
1. Set the following switches on the sub control panel.
   OUT REF switch: INPUT VIDEO
   CHARACTER switch: ON
2. Set the operation system in the VTR using the setup menu ITEM-013 as follows:
   DNW-A75: 525/60 system
   DNW-A75P: 625/50 system
   (Refer to Section 7-2-2 of the operation manual.)
3. Press the PB.EE button on the lower control panel to light its indicator.
4. Set the setup extend menu as follows.
   ITEM-105 to “ON”.
   ITEM-309 to “AUTO”.
5. For the DNW-A75 only, set the sub-ITEMs 0 and 1 in the setup extend menu ITEM-709 to “D-1”.
6. Input the analog composite video signal (BB signal) to REF VIDEO connector (75 Ω switch: ON).
7. Turn the CHARACTER switch to “OFF”.

Checks

1. Input the 75 % color-bar signal (composite) to VIDEO INPUT COMPOSITE connector (75 Ω switch: ON).
2. Set VIDEO INPUT SELECT to “COMPOSITE”.
3. Check that the STOP button is not blinking.
4. Check that abnormality does not exist in the output signal from COMPOSITE 1/2/3 of VIDEO OUTPUT connectors using the composite waveform monitor.
5. Input the 75 % color-bar signal (D-1 format, component) to VIDEO INPUT COMPONENT connectors (Y/R-Y/B-Y).
6. Set VIDEO INPUT SELECT to “COMPONENT”.
7. Check that the STOP button is not blinking.
8. Check that abnormality does not exist in the output signal from COMPONENT Y/R-Y/B-Y of the VIDEO OUTPUT connectors using the component waveform monitor.

Perfection

1. Set the CHARACTER switch to “ON”.
2. Return the setup extend menus ITEM-105/309/709 to the customer settings, and also return the OUT REF and CHARACTER switches to the customer settings.



Ex. 75 % Color-bar

1-9-9. CP-335 Board

After replacing or repairing this board, perform the following check.

Preparing tools

- Equipment to generate the AES/EBU signal:
  Other DNW-A75 or equivalent

Checks

1. Set the AUDIO SELECT to “INPUT” and CH1/2/3/4 to AES/EBU.
2. Connect other DNW-A75 (or equivalent) to CH1/2 and CH3/4 of AUDIO INPT (AES/EBU), then input the AES/EBU signal (1 kHz −20 dBFS).
3. Check that the level meters of CH1 to CH4 indicate −20 dBFS.
4. Disconnect the connection of step2, then connect them to CH1/2 and CH3/4 of AUDIO OUTPUT (AES/EBU).
5. To generate the test signal , select “1KHz SINE 0VU” using C23 AUDIO TEST SG of the maintenance mode.
   Refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.
6. Check that the level of CH1 to CH4 indicate −20 dBFS by the level meters of other DNW-A75/A75P (or equivalent).
7. Exit the maintenance mode.

1-9-10. DEC-110 Board

After replacing or repairing this board, perform the video input system adjustment (Section 2-9).

1-9-11. DM-89 Board

Note

The board that a suffix of service parts cord is A is inavailable for this unit.

After replacing or repairing this board, perform the analog Betacam PB system adjustment (Sections 2-11-2 to 2-11-19).

1-9-12. DPR-118 Board

After replacing or repairing this board, check that the VTR is able to correctly record the audio and video on the cassette tape and play back.

1-9-13. DR-315 Board

After replacing or repairing this board, perform the servo system electrical adjustments (Sections 2-5-3 and 2-5-5).

1-9-14. DT-34D Board

After replacing or repairing this board, perform the analog DT system adjustment (Sections 2-5-6 and 2-5-7).

1-9-15. EQ-75 Board

After replacing or repairing this board, perform the RF system electrical adjustments (Section 2-6).

1-9-16. FP-117 Board

After replacing or repairing this board, perform the electrical adjustments (Section 2-12).

1-9-17. KY-438 Board

After replacing or repairing this board, check the functions of the switches, indicators, etc. on this board.

1-9-18. LP-81 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment when inserting the cassette tape.
2. Check that the all cassette compartment lamps (LEDs) are lighted with the cassette tape inserted.

1-9-19. MB-818 Board

After replacing or repairing this board, check the VTR’s basic function is correct.

1-9-20. MS-58 Board

After replacing this board or its NV-RAM

1. Perform the servo/DT system electrical adjustments (Section 2-5).
   Note
   Be sure to adjust after initializing the servo adjustment data in the NV-RAM on the MS-58 board.
   (Refer to Section 2-5-2.)
2. Set the serial number of the VTR using M31 : SERIAL NUMBER in the maintenance mode.
   (Refer to “4-4-3. SERIAL NUMBER Display Menu (M31)” of the maintenance manual part 1.)
3. Set the head room of the audio level meter using M37 : METER HEAD ROOM in the maintenance mode.
   (Refer to “4-4-7. METER HEAD ROOM Setup Menu (M37)” of the maintenance manual part 1.)

After repairing (except the NV-RAM replacement):
Usually perform the servo system alignment (Section 2-5).
When repairing the circuit containing from RV901 to CN24 in the demagnetization head driving circuit on the MS-58 board, perform “2-4. Demagnetization Head Driving Voltage Adjustment”.

1-9-21. PC-70 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment using C013 : CASSETTE COMP MOTOR. in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)
2. Check the functions of the cassette size sensors and cassette-in sensors in the cassette compartment using C001 : CASSETTE COMP. SW in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-22. PD-35 Board

After replacing or repairing this board, check the function of the pinch solenoid using C020 : PINCH ROLLER of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

Note
Since the mounted PD-35 board is out of service part, prepare the plain PD-35 board and the components of the PD-35 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-9-23. PTC-54 Board

After replacing or repairing this board, check that error code 09 does not occur while the tape is threading.

1-9-24. PTC-59 Board

Note
Since the mounted PTC-59 board is out of service part, be sure to replace the MC sensor assembly when needing to replace this board.

After replacing the MC sensor assembly or repairing this board, check the functions of the cassette tab sensors using C000 : CASSETTE SW in the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-25. PTC-69 Board

After replacing or repairing this board, perform the electrical adjustments (Section 2-3).
Note
When replacing the search dial assembly, need not the electrical adjustments for the PTC-69 board is not needed.

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1-9-26. PTC-71 Board

After replacing or repairing this board, check the functions of the reel position sensors using C016 : REEL POSITION MOTOR of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-27. RM-82/RM-181 Board

After replacing or repairing this board, perform “Adjustment after Replacement” in “3-15. Reel Motor Assembly Replacement”.

1-9-28. RM-130 Board

After replacing or repairing this board, check that the error (error code 92) does not exist after turning the power ON.

1-9-29. RM-179 Board

After replacing the board or its NV-RAM
Execute RESET ALL DATA of M392: NV-RAM CONTROL in the maintenance mode to reset to the factory setting data.
Refer to “4-4-8. 50PIN DATA ASSIGN Mode (M39)” of the maintenance manual Part 1.

After repairing the board
(except to replacing the NV-RAM)
Check that the error (error code 95) does not exist after turning the power ON.

1-9-30. SDI-41 Board

After replacing or repairing this board, perform the following check.

Tools

- Digital component video signal generator:
  TEKTRONIX TSG-422 option-1S or equivalent
- Video monitor for the serial digital input:
  SONY BVM-1410 (with optional BKM-2085-14) or equivalent

Check

1. Set VIDEO INPUT SELECT to “SDI”.
2. Input the 4:2:2 component digital video signal to SDI INPUT connector from the digital component video signal generator.
3. Check that no abnormality exists in the picture watching the video monitor connected to SDI OUTPUT connector. (active through out 1, 2 and 3)

1-9-31. SE-344 Board

Note
Since the mounted SE-344 board and the component on this board are out of service parts, be sure to replace the reel FG assembly when needing to replace/repaire this board.

After replacing the reel FG assembly, perform “3-15-7. Reel Table Rotation Sensor Position Adjustment”.

1-9-32. SE-461 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the dew condensation sensor using C003 : DEW SENSOR in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)
2. Check that the VTR is able to record on the cassette tape.

1-9-33. SS-83 Board

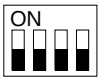
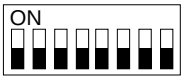
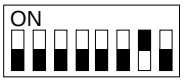
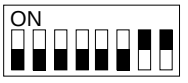
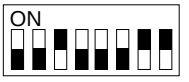
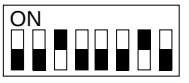
When replacing:

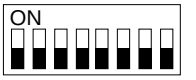
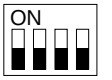
When replacing this board, perform the followings.

1. Check the settings of the setup menu (main and extended menus).
   Write the setting of the setup menu on a copy of "Appendix B. Setting Check Sheet" in the maintenance manual Part 1 if possible.
2. Check that the DIP switches S101, S1100, S1900, S2100 and S2701 are set as following. Moreover set S1102 as following.

Note

- ■ marks stand for the position of knobs
- The description for each DIP switch is described in Section 1-10-5 of the maintenance manual Part 1.

Ref No.	Setting	Remarks
S101		Factory setting
S1100		• Perform the setup menu reset which should be done after board replacement, then set No.1 switch to the same setting as the removed SS-83 board.
S1102	DNW-A75  DNW-A75P  TTV4075P  TTV4075N 	Factory setting
S1900		Factory setting

Ref No.	Setting	Remarks
S2100		Factory setting
S2701		Factory setting

After replacing

After replacing or repairing this board, perform the following checks.

1. Reset the setup menu (main and extended menus) as setting written on a copy of the setting check sheet.
2. Clear the error logger using the error logger display mode of the maintenance mode.
   Refer to "4-3. Error Logger Display Mode (M2)" in the maintenance manual Part 1.
3. Set the calendar/clock using the error logger display mode of the maintenance mode.
   Refer to "4-3. Error Logger Display Mode (M2)" in the maintenance manual Part 1.

After replacing the NV-RAM

Perform the service action after replacing referring to "1-3. NV-RAM".

After repairing the board (except replacing the NV-RAM)

Perform the servo/DT system electrical adjustment (Section 2-5).

1-9-34. SWC-31 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

Note

Perform the system phase adjustment again for the VTR referring to the manual of the analog switcher when using the analog switcher with this VTR.

1-9-35. SWC-35 Board

After replacing or repairing this board, check the functions of the switches and indicators on this board.

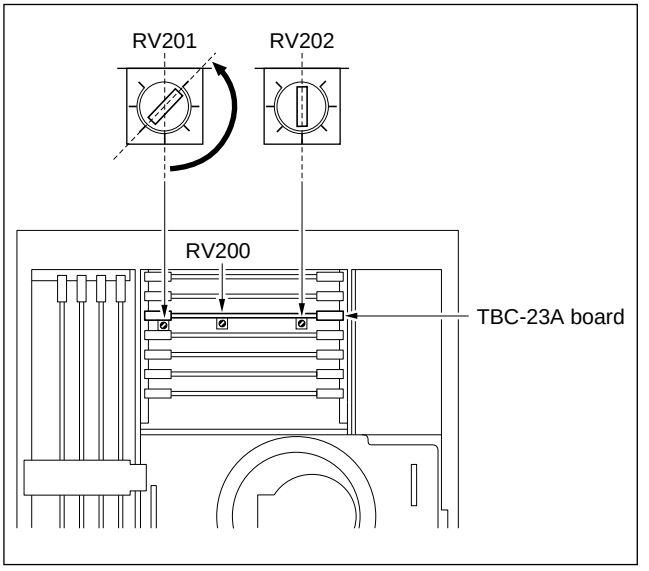
1-9-36. TBC-23A Board

After replacing:

Perform the analog Betacam PB system adjustment (Sections 2-11-2, 3, 24, 25, and 28).

After repairing:

1. Set RV201 and RV202 on the TBC-23A board as shown figure below.



RV201 and RV202 on TBC-23A Board

2. Perform the analog Betacam PB system adjustment (Sections 2-11-2, 3, 24, 25 and 28).

1-9-37. TBC-24 Board

Note

The boards of board numbers 11 through 15 are inavailable for this unit without completing the specified modification to them.

After replacing:

Perform the analog Betacam PB system adjustment (Sections 2-11-2 and 2-11-19 or later).

After repairing:

- When RV202 on the TBC-24 board (board number suffix is 16 and higher) for DNW-A75P was replaced, set RV202 to the mechanical center.
- When RV303 on the TBC-24 board was replaced, perform " 2-11-22. TBC VCO Free-running Adjustment" and later (except Section 2-11-23).
- In other case, perform the analog Betacam PB system adjustment (Sections 2-11-2 and 2-11-19 or later).

1-9-38. TC-102 Board

After replacing or repairing this board, perform LCT alignment and full erase current check (Section 2-13).

1-9-39. TR-78 Board

Note

Since the mounted TR-78 board and the component on this board are out of service parts, be sure to replace the S-tension regulator assembly when needing to replace/repaire this board. (Refer to Section 3-23.)

After replacing the S-tension regulator assembly, perform the tape running adjustment (Section 4-1-2).

1-9-40. TR-79 Board

After replacing or repairing this board, perform the following checks.

1. Check the functions of the threading and unthreading sensors using C012 : THREADING MOTOR in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)
2. Execute A008 : S/T TENSION OFFSET in the maintenance mode. Then, save the adjustment data in A012 : NV-RAM CONTROL. Refer to “4-2-7. SERVO ADJUST Mode (A00-01)” of the maintenance manual part 1.

1-9-41. VPR-47 Board

After replacing or repairing this board, perform the video system alignment (Section 2-8).

1-9-42. VR-223 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

1-9-43. VR-224 Board

Section 2
Electrical Alignment

2-1. Electrical Alignment Overview

2-1-1. Notes on Electrical Alignment

- Be sure to adjust each block in order unless any instructions are provided.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.
  Note
  NV-RAM control menu for the servo and DT systems have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 4 of the maintenance manual Part 1.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the maintenance manual Part 1 “Appendix B” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

2-1-2. Outline of Electrical Alignment

In Section 2 explains the all electrical adjustment to each block (include the optional boards).

Block	Reference	Contents	Object of adjustment
Power supply unit	Section 2-2	Output voltage check/adjustment of power supply unit	———
Search dial	Section 2-3	Search dial pulse duty adjustment	PTC-69
Demagnetization head	Section 2-4	Demagnetization head driving voltage adjustment	MS-58
Servo/DT	Section 2-5	Servo system alignment	DT34D, MS-58, SS-83
RF	Section 2-6	RF system alignment	EQ-75
Audio	Section 2-7	Adjustments of Analog audio input/output line and Analog Betacam LAU/AFM PB line	APR-40, AU-260
Video	Section 2-8	Adjustments of Video reference signal, Video process, and Analog video output	VPR-47
Video input	Section 2-9	Adjustments of Analog composite input line and Analog DEC-110 component input line	DEC-110
Analog Betacam video	Section 2-10	Analog Betacam video PB system alignment	DM-89, TBC-23A, TBC-24
SDI/SDTI	Section 2-11	Free-running VCO adjustment of Encoder/Decoder for SDI and SDTI interface	SDI-41, DPR-119, DPR-120
Video remote control	Section 2-12	TBC remote control offset adjustment	FP-117
Full erase, Time code	Section 2-13	LTC system adjustment/check and Full erase current check	TC-102

2-2. Power Supply Line Alignment

2-2-1. Output Voltage Check

When the power supply unit in the VTR was replaced, perform the output voltage check.

Note

Be sure to perform the check before reattaching the bottom plate.

Tool

- Digital voltmeter: ADVANTEST TR6845 or equivalent

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Place the VTR on its right side panel down.
4. When the bottom plate was reattached, remove it. (Refer to Section 2-3-1 of the maintenance manual part 1.)
5. Connect the power cord.
6. Wait for 10 minutes after turning on the power.

Voltage Check

Check each output voltage of power supply lines at the following points.

Note

Measure at the terminal contact of the connected harness wire.

Line	Measurement point	Specification	Remarks
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘
−8 V	CN252-4/MAIN2(glay)	−7.7 ±0.7 V	
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	
−15 V	CN254-9A/MAIN2(glay)	−15.0 ±1.0 V	
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	

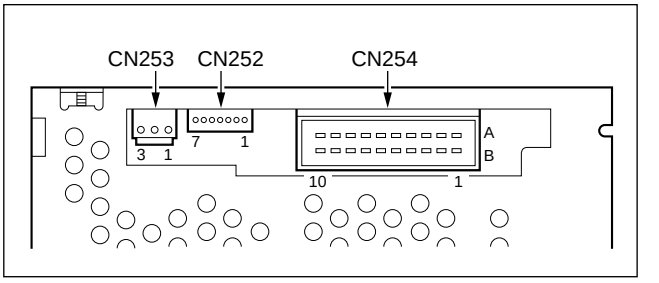
If the specification is not satisfy

- For the power lines with a ⊘-mark in remarks column of the above table: Can be adjusted the output voltage. Be sure to adjust with the power supply unit settled in adjustable condition referring to Section 2-2-2.
- For without a ⊘-mark in remarks column of the above table: Can not be adjusted the output voltage. Replace the power supply unit, or make sure that repair of this unit had been completed.

Note

Pin assignments of the connectors (CN252, CN253, and CN254) in the power supply unit are as follows:

Ref. No.	Pin No.	Output voltage (Signal name)	Wire color
CN252	1	GND	White
	2	GND	Gray
	3, 4	−8 V	Gray
	5	(FAN MOTOR CHECK)	Gray
	6	+12 V	Gray
	7	GND	Gray
CN253	1	18 V (UNREG +18 V)	Brown
	2, 3	GND (UNREG GND)	Black
CN254	1A, 2A	+3.4 V	Orange
	3A, 4A	+5.1 V	Brown
	5A, 6A	+8 V	Red
	7A, 8A	GND	Black
	9A	−15 V	White
	10A	GND	Black
	1B, 2B	+3.4 V	Orange
	3B, 4B	+5.1 V	Brown
	5B	+2.5 V	Blue
	6B	+8 V	Red
	7B, 8B	GND	Black
	9B	+15 V	White
	10B	GND	Black



Power Supply Unit (MAIN2 Board)

2-2-2. Output Voltage Adjustment

When the power supply unit was repaired, perform the adjustment (check) under disclosing the power supply unit.

CAUTION

Since the primary circuit is exposed, be extremely careful with not to get an electric shock.
When completing the adjustments and checks, turn off the POWER switch without delay.

Tools List

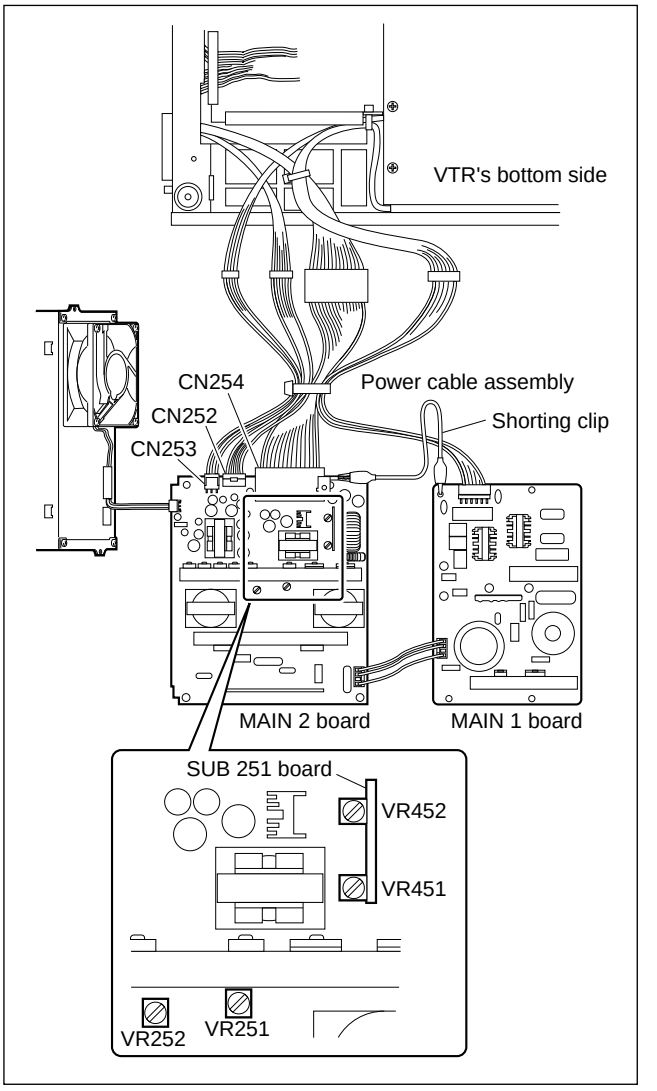
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Power cable assembly (Part No. A-8321-333-A)
- Shorting clip

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Remove the power supply unit.
   (Refer to Section 3-29.)
4. Reattach a power supply panel assembly under staying on the VTR's right side panel down.
   (Do not reattach the bottom plate.)
5. Connect the four connectors of the power cable assembly to each connector of the VTR's harnesses that were connected to the power supply unit before.
6. Take a power supply unit to pieces as figure of right.
   (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
7. Reconnect the MAIN1 board and MAIN2 board with a harness of the power supply unit.
8. Connect the four connectors of the power cable assembly to the MAIN1 board and MAIN2 board.

   Note

   Be sure to confirm that nothing is the cause of the short circuit under the MAIN1 and MAIN2 boards.
9. Connect both GND of the MAIN1 board and MAIN2 board with a shorting clip.
10. Connect the power cord.
11. Wait for 10 minutes after turning on the power.



Voltage Adjustment (Check)

Adjust and check each output voltage of power supply lines at the following points.

Line	Measurement point	Specification	Adjust. point
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	Check only
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘VR251/MAIN2
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘VR252/MAIN2
–8 V	CN252-4/MAIN2(glay)	–7.7 ±0.7 V	Check only
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	Check only
–15 V	CN254-9A/MAIN2(glay)	–15.0 ±1.0 V	Check only
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	Check only
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘VR452/SUB251
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	Check only

2-3. Dial Pulse Adjustment (PTC-69 Board)

When the PTC-69 board was replaced or the dial pulse generating circuit on the PTC-69 board was repaired, perform the dial pulse adjustment.

Note

Be sure to perform the adjustments with the search dial assembly separated from the lower control panel assembly. When uniting both assemblies, remove the search dial assembly from the lower control panel assembly as follows:

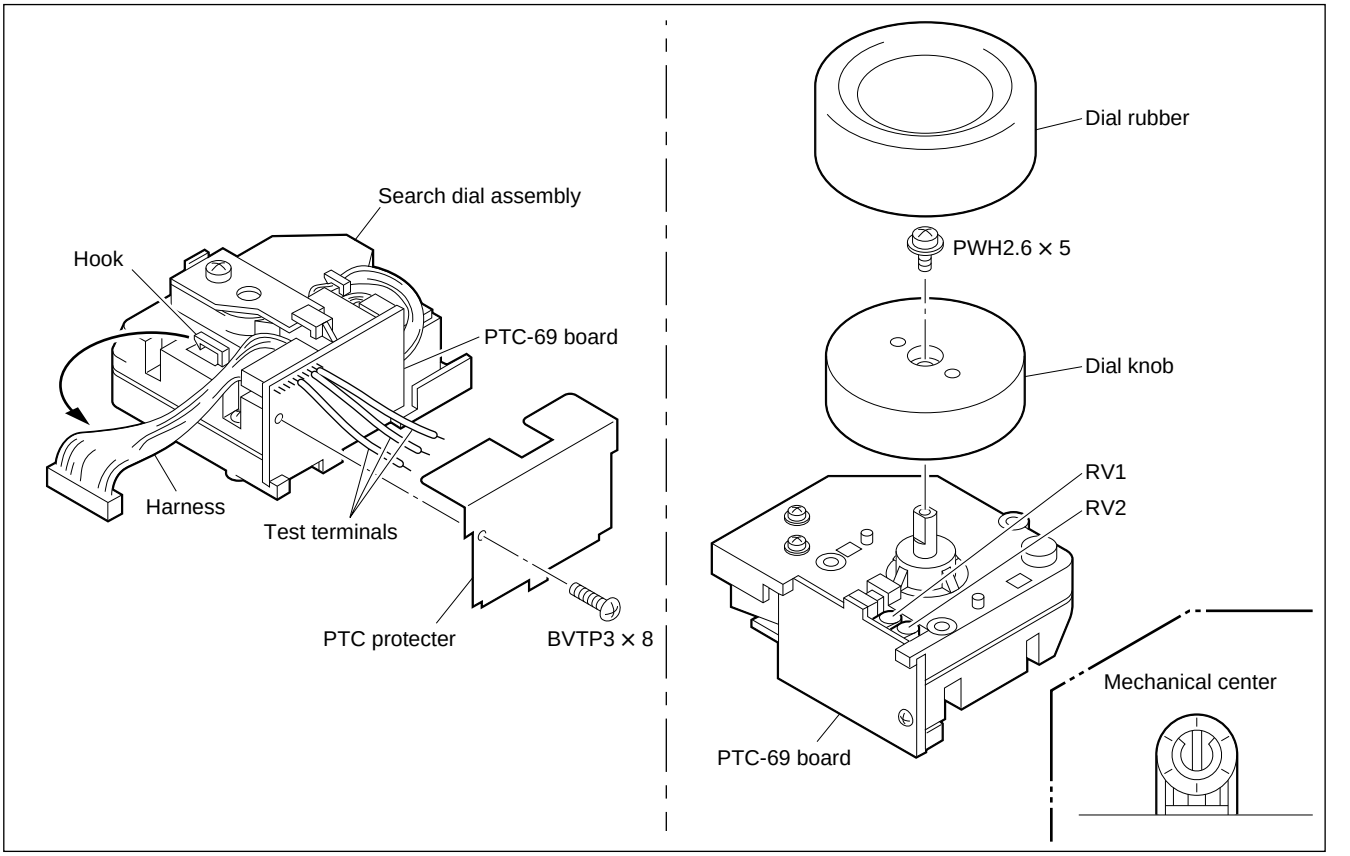
1. Remove a panel from the lower control panel assembly. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Remove the dial rubber, dial knob, and search dial assembly from the lower control panel assembly. (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
3. Disconnect the harness from CN69 on the KY-438 board of the lower control panel assembly.

Tools List

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Solder iron
- Test terminals, such as covered wire (3 pieces)

Preparation

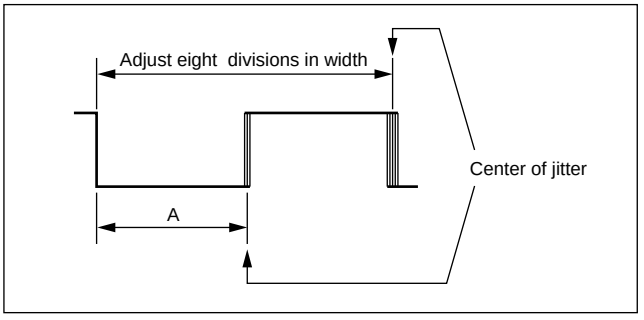
1. Remove the PTC protector after removing a screw.
2. Solder the three test terminals to the connector CN2's pins 2, 3 and 6 on side B of the PTC-69 board.
3. Fix the PTC-69 board with a screw that is removed at step 1 (without the PTC protector).
4. Attach the dial knob and dial rubber to the search dial assembly.
5. When the PTC-69 board is replaced, set RV1 and RV2 to the mechanical center.
   When the potentiometer RV1 or RV2 is replaced, set it (RV1 or RV2) to the mechanical center.
6. Connect the harness to CN69 of the KY-438 board with this harness unhooked.
7. Turn on the POWER switch.
8. To turn the search dial to JOG mode, press the JOG button.



Preparation

Adjustment (Check)

1. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 2 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
2. During turn the search dial at uniform speed and reverse direction (↺), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
3. During turn the search dial at the same as step 2, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV1/PTC-69 (inside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)
4. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 3 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
5. During turn the search dial at uniform speed and forward direction (↻), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
6. During turn the search dial at the same as step 5, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV2/PTC-69 (outside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)



Waveform on Oscilloscope

Perfection

1. Turn off the POWER switch.
2. Unsolder and remove the three test terminals from CN2 on the PTC-69 board.
3. Remove a screw fixing the PTC-69 board, then fix the PTC-69 board and PTC protector with removed screw.
4. Hook the harness that connected to the lower control panel assembly.
5. Remove the dial rubber and dial knob from the search dial assembly.
6. Reinstall the search dial assembly to the lower control panel assembly.
7. Reattach the panel on the lower control panel assembly.
8. Reattach the dial knob and dial rubber.

2-4. Demagnetization Head Driving Voltage Adjustment (MS-58 Board)

When the related circuit from RV901 to CN24 in the demagnetization head driving circuit on the MS-58 board was repaired, perform this adjustment.

Note

Be sure to adjust with the shield plate (bottom) removed. When the shield plate (bottom) was reinstalled, remove it.

Tools List

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Betacam SP cassette tape (metal particle type)

  Note

  Never use the alignment tape because it may dwindle the magnetic potential of this tape.

Preparation

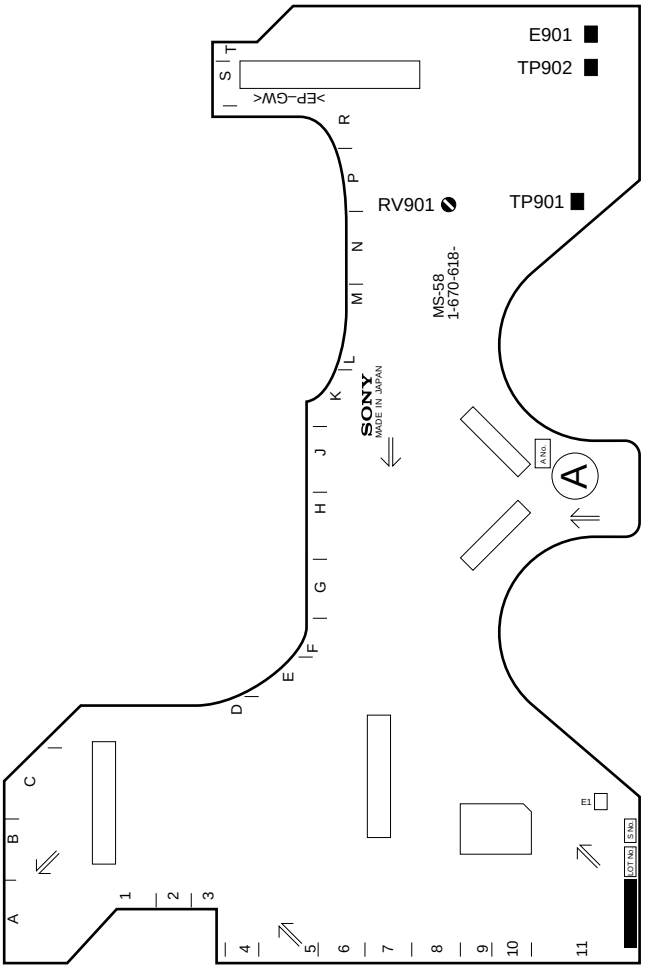
1. Connect the power cord and turn on the power.
2. Insert the Betacam SP cassette tape (metal particle type).
3. Turn off the power.
4. Place the VTR with its right side panel down.

Adjustment

1. Connect the digital voltmeter to TP901(P-11) on the MS-58 board.
   GND: E901/MS-58(T-11)
2. Turn on the power.
3. During play back the inserted cassette tape in PLAY mode, adjust so that the measuring voltage satisfy the specification.
   Adj. point: ⊘RV901/MS-58(P-8)
   Specification: 180 $^{+5}_{-10}$mV dc

Perfection

1. Turn off the power.
2. Reattach the shield plate (bottom).
3. Reattach the bottom plate.
4. Replace the VTR to normal from falling sideways.
5. Turn on the power.
6. Eject the cassette tape.



MS-58 Board (Side A)

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2-5. Servo/DT Systems Alignment

2-5-1. Adjustment Overview

All the adjustments of the servo and DT systems are adjusted using the menus in the maintenance mode. When the MS-58 board or NV-RAM (IC9/MS-58 board) was replaced, be sure to initialize the NV-RAM referring to Section 2-5-2 before starting the adjustments of the servo/DT systems alignment.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.
The countermeasures against the malfunction of an automatic adjustment (an error message “ADJUST IN-COMPLETE” will be displayed on the video monitor) had been described there.

Tools List

To perform the servo system alignment for the VTR, prepare the following equipment and fixtures.

- Alignment tapes: SR2-1 (Part No. 8-960-075-11), SR2-1P (Part No. 8-960-075-61) , CR2-1B (Part No. 8-960-096-01) , and CR2-1B PS (Part No. 8-960-096-51)
- Analog composite video monitor (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Remarks
2-5-2	Servo/DT adjustment data initialization		S100/SS-83	Perform Section 2-5-2 only when replacing the MS-58 board or NV-RAM (IC9/MS-58).
2-5-3	Servo continuity automatic adjustment		A000 : A001-A008 ADJ.	S reel FG duty adjustment (A001) T reel FG duty adjustment (A002) Capstan FG duty adjustment (A003) S reel offset/friction adjustment (A004) T reel offset/friction adjustment (A005) S reel torque adjustment (A006) T reel torque adjustment (A007) S/T reel tension offset adjustment (A008)
		Data save	A012 : NV-RAM CONTROL	
2-5-4	Capstan free speed adjustment		A010 : CAPSTAN SPEED	Perform the adjustment and data saving in both
	(Standard video system)	Data save	A012 : NV-RAM CONTROL	525/60 and 625/50 systems.
2-5-5	RF switching position adjustment		A011 : RE SWITCHING POS.	Perform the adjustment and data saving in either
		Data save	A012 : NV-RAM CONTROL	525/60 or 625/50 system.
2-5-6	DT system adjustment (Standard video system)			Perform the adjustment and data saving in both
	DT head offset level adjustment		A030 : HEAD OFFSET LEVEL	525/60 and 625/50 systems.
	DT drive gain adjustment		A031 : DRIVE GAIN	
		Data save	A032 : DATA SAVE	
2-5-8	Capstan free speed adjustment		A010 : CAPSTAN SPEED	
	(Another video system)	Data save	A012 : NV-RAM CONTROL	
2-5-9	DT system adjustment (Another video system)			
	DT head offset level adjustment		A030 : HEAD OFFSET LEVEL	
	DT drive gain adjustment		A031 : DRIVE GAIN	
		Data save	A032 : DATA SAVE	

2-5-2. Servo/DT Adjustment Data Initialization

After replacing the MS-58 board or NV-RAM (IC9/MS-58 board) on, have to initialize the servo/DT adjustment data stored the NV-RAM on MS-58 board.
Can to initialize in the following procedure.

How to initialize

With S100/SS-83(D-1) pressing, turn on the power.

Note

Afer the initialization, be sure to perform Section 2-5-3 through 2-5-10.

2-5-3. Servo Continuity Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A000 : A001-A008 ADJ.
3. To execute this adjustment, press the SET button once on the lower control panel.
   - The execution time is about 150 seconds.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit the this menu, press the MENU button once on the lower control panel.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustment was not completed normally.

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

6. To exit the maintenance mode, press the MENU button five times.

2-5-4. Capstan Free Speed Adjustment (Standard Video System)

Prepare the following two alignment tapes to perform this adjustment.
DNW-A75 (at 525/60 system) : SR2-1 and CR2-1B
DNW-A75P (at 625/50 system) : SR2-1P and CR2-1B PS

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN SPEED.
3. Insert the alignment tape SR2-1 (or SR2-1P), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit this menu, press the MENU button once.
5. To exit A00-01 : SERVO ADJUST, press the MENU button once.
6. Enter A00-01 : SERVO ADJUST again.
   - The alignment tape is ejected.
7. Enter A010 : CAPSTAN SPEED again.
8. Insert the alignment tape CR2-1B (or CR2-1B PS), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
9. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

10. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
11. To exit the maintenance mode, press the MENU button five times.
12. Eject the alignment tape.

2-5-5. RF Switching Position Adjustment

Prepare the following alignment tape to perform this adjustment.
- SR2-1 (at 525/60 system)
- SR2-1P (at 625/50 system)

Note

Be sure to adjust in either 525/60 or 625/50 system. When the adjustment is performed in one system, it is not required in the other system.

1. Insert the alignment tape SR2-1/SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select “AUTO”.
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

2-5-6. DT System Adjustment (Standard Video System)

Prepare the following alignment tape to perform this adjustment.
DNW-A75 (at 525/60 system) : CR5-1B or CR5-2A
DNW-A75P (at 625/50 system) : CR5-1B PS or CR5-2A PS

1. DT Head Offset Level Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2. DT Drive Gain Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   - The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   - The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   - The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

3. Data Save (Store the Adjusted Data)

1. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

2. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically..

2-5-7. Preparation in Another Video System

Note

Be sure to perform the adjustments in the another video system after completing the adjustments in the standard video system

Switch the video system to the another video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And switch the video system of the video monitor.
DNW-A75 : 625/50 system (PAL)
DNW-A75P : 525/60 system (NTSC)

2-5-8. Capstan Free Speed Adjustment (Another Video System)

Prepare the following two alignment tapes to perform this adjustment.
DNW-A75 (at 625/50 system) : SR2-1P and CR2-1B PS
DNW-A75P (at 525/60 system) : SR2-1 and CR2-1B

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN SPEED.
3. Insert the alignment tape SR2-1P (or SR2-1), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit this menu, press the MENU button once.
5. To exit A00-01 : SERVO ADJUST, press the MENU button once.
6. Enter A00-01 : SERVO ADJUST again.
   - The alignment tape is ejected.
7. Enter A010 : CAPSTAN SPEED again.
8. Insert the alignment tape CR2-1B PS (or CR2-1B), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
9. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

10. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
11. To exit the maintenance mode, press the MENU button five times.
12. Eject the alignment tape.

2-5-9. DT System Adjustment (Another Video System)

Prepare the following alignment tape to perform this adjustment.
DNW-A75 (at 625/50 system) : CR5-1B PS or CR5-2A PS
DNW-A75P (at 525/60 system) : CR5-1B or CR5-2A

1. DT Head Offset Level Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2. DT Drive Gain Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   - The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   - The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   - The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

3. Data Save (Store the Adjusted Data)

1. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
2. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2-5-10. Perfection

Return the video system to standard video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And return the video system of the video monitor.
DNW-A75 : 525/60 system (NTSC)
DNW-A75P : 625/50 system (PAL)

2-6. RF System Alignment (EQ-75 Board)

2-6-1. Adjustment Overview

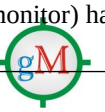
There are the following in the RF system of the VTR.
- Record system of the Betacam SX format
- Playback system of the Betacam SX format
- Playback system of the Betacam / Betacam SP formats

For the RF adjustment for the Betacam SX format (record and playback), perform the automatic adjustments in the menu of the maintenance mode.
For the Betacam / Betacam SP format, perform the manually adjustments in the menu of the maintenance mode.

For the DNW-A75's Betacam / Betacam SP PB function, be sure to adjust in the 525/60 system.
For the DNW-A75P's Betacam / Betacam SP PB function, be sure to adjust in the 625/50 system.
If differing, should change the video system in the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.
The countermeasures against the malfunction of an automatic adjustment (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor) had been described there.



Tools List

To perform the RF system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A) (for the extension of DM-89 board)
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tapes for DNW-A75:
  SR5-1 (Part No. 8-960-075-01),
  CR5-1B (Part No. 8-960-096-41), and
  CR5-2A (Part No. 8-960-097-44)
- Alignment tapes for DNW-A75P:
  SR5-1P (Part No. 8-960-075-51),
  CR5-1B PS (Part No. 8-960-096-91), and
  CR5-2A PS (Part No. 8-960-098-44)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
2-6-2	Betacam SX format overall RF system adjustment		A17 : A11-A16 ALL ADJUST	(Automatic adjustments)
		Data save	A1F : NV-RAM CONTROL	
2-6-3	Betacam / Betacam SP format PB system (EQ RF output level) adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Data save	A3F : NV-RAM CONTROL	

Refer to Section 2-6-4 in order to adjust the recording current only.

Section	Item (Section title)		Adjustment point	Remarks
2-6-4	Recording current adjustment		A12 : REC CURRENT	Automatic adjustment
		Data save	A1F : NV-RAM CONTROL	

2-6-2. Betacam SX Format Overall RF System Adjustment

Preparing tools

- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tape
  For DNW-A75: SR5-1 (Part No. 8-960-075-01)
  For DNW-A75P: SR5-1P (Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean the video heads.

(Refer to "5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning" of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 4-2-9 of the maintenance manual part 1.

Overall RF System Adjustment

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.

PB system adjustment

3. Enter A17 : A11-A16 ALL ADJUST in the maintenance mode.
   - Message "Auto Adjust (Push SET)" is displayed on the video monitor.
4. To execute the automatic adjustments for PB system, press the SET button once on the lower control panel.
   - Message "Set a blank tape and press SET button for REC CURRENT adjustment" is displayed on the video monitor when the PB system adjustments are completed normally.
5. To eject the alignment tape, press the SET button once.
6. Take out this tape.

REC system adjustment (Rec. current adjustment)

7. Insert the recording tape.
8. To execute the automatic adjustment for the recording current, press the SET button once.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
9. To exit the maintenance mode, press the MENU button four times.
10. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

11. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
12. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

Note

When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

13. To exit the maintenance mode, press the MENU button four times.

2-6-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

After turning off the power, remove the DM-89 board.

2. Check the setting of the sub control panel.

CHARACTER switch ⇨ ON

3. Check the video system.

Check that the operation system is setting as follows:
DNW-A75: 525/60 system
DNW-A75P: 625/50 system
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

How to change the data

(1) Set the ∗ mark on the video monitor to the line to be changed the data by turning the search dial.
(In the time data display area of the VTR, display the item by turning it, “RF G M-Y-A” for example.)
(2) To change the data, turn the search dial with the JOG button pressing.

1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A3 : BETACAM PB ADJUST in the maintenance mode.
3. Enter A30 : EQ VR.

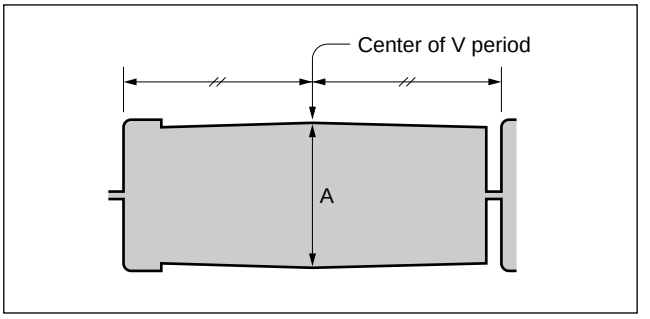
When the EQ-75 board or NV-RAM (IC900/EQ-75 board) was replaced, perform step 4.

4. Set the following initial data to all the items of A30 : EQ VR.
   DNW-A75: Data on 525/60 column
   DNW-A75P: Data on 625/50 column

Item (A30 : EQ VR)	Initial data 525/60	625/50
RF GAIN METAL-Y-A	48	80
RF GAIN METAL-Y-B	48	80
RF GAIN METAL-C-A	48	80
RF GAIN METAL-C-B	48	80
RF GAIN OXIDE-Y-A	48	80
RF GAIN OXIDE-Y-B	48	80
RF GAIN OXIDE-C-A	48	80
RF GAIN OXIDE-C-B	48	80

2. METAL Y Adjustment

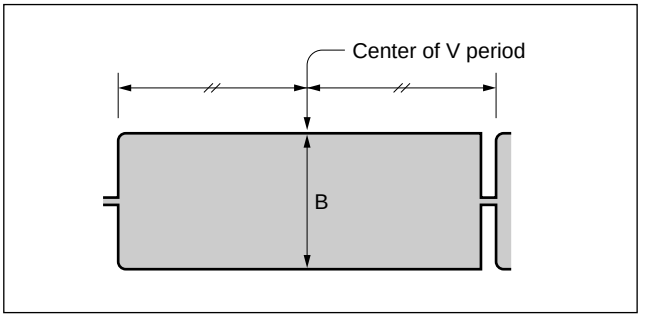
1. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   AC 100 mV/DIV
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   DC 1 V/DIV
   TIME: 2 ms/DIV
   TRIG: CH-2
2. To perform the tape operation, press the SET button once on the lower control panel.
3. Play back the flat field signal portion (24:00 to 26:00) of the following alignment tape in PLAY mode.
   For DNW-A75: CR5-1B
   For DNW-A75P: CR5-1B PS
4. To operate the maintenance mode, press the MENU button on the lower control panel.
5. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL Y-A (ch-A of METAL Y).
   Adj. point: A30 : EQ VR : RF GAIN METAL-Y-A
   Specification: A = 380 ±20 mV p-p
6. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL Y-B (ch-B of METAL Y).
   Adj. point: A30 : EQ VR : RF GAIN METAL-Y-B
   Specification: A = 380 ±20 mV p-p
7. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL Y-A and METAL Y-B until they are identical amplitude.



8. To perform the tape operation, press the SET button once.
9. Stop the playback of the alignment tape.

3. METAL C Adjustment

1. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
   CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. Play back the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B / CR5-1B PS in PLAY mode.
3. To operate the maintenance mode, press the MENU button once.
4. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL C-A (ch-A of METAL C).
   Adj. point: A30 : EQ VR : RF GAIN METAL-C-A
   Specification: B = 380 ±20 mV p-p
5. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL C-B (ch-B of METAL C).
   Adj. point: A30 : EQ VR : RF GAIN METAL-C-B
   Specification: B = 380 ±20 mV p-p
6. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL C-A and METAL C-B until they are identical amplitude.



7. To perform the tape operation, press the SET button once.
8. Stop the playback of the alignment tape, then eject it.

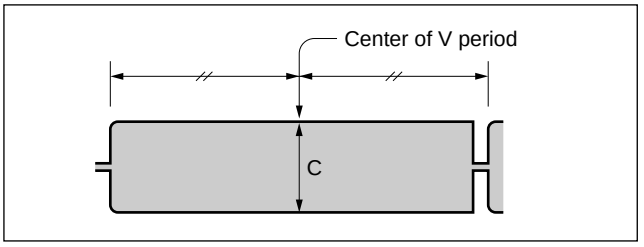
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4. OXIDE C Adjustment

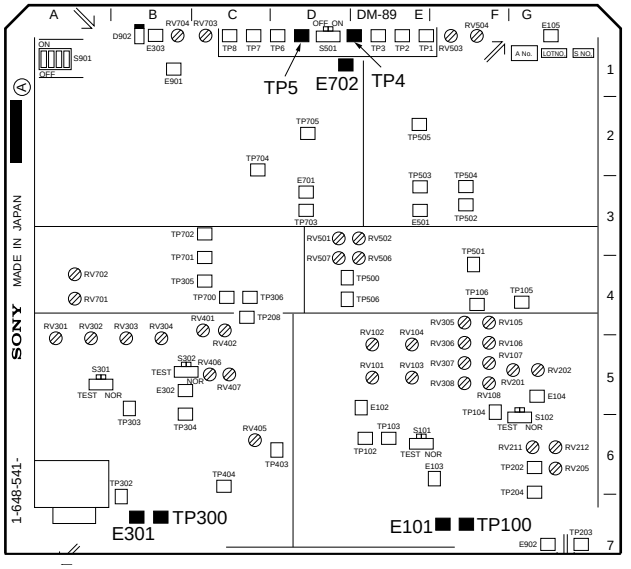
Note

The connections and settings of the oscilloscope are the same as “METAL C Adjustment”.

1. Play back the 75% color-bar signal portion (0:00 to 3:00) of the following alignment tape in PLAY mode.
   For DNW-A75: CR5-2A
   For DNW-A75P: CR5-2A PS
2. To operate the maintenance mode, press the MENU button once.
3. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE C-A (ch-A of OXIDE C).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE C-A
   Specification: C = 250 ±20 mV p-p
4. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE C-B (ch-B of OXIDE C).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE C-B
   Specification: C = 250 ±20 mV p-p
5. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE C-A and OXIDE C-B until they are identical amplitude.



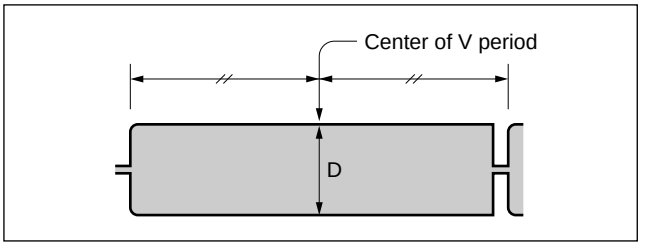
6. To perform the tape operation, press the SET button once.
7. Stop the playback of the alignment tape.



DM-89 Board (Side A)

5. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
2. Play back the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A / CR5-2A PS in PLAY mode.
3. To operate the maintenance mode, press the MENU button once.
4. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE Y-A (ch-A of OXIDE Y).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-A
   Specification: D = 250 ±20 mV p-p
5. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE Y-B (ch-B of OXIDE Y).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-B
   Specification: D = 250 ±20 mV p-p
6. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE Y-A and OXIDE Y-B until they are identical amplitude



7. To perform the tape operation, press the SET button once.
8. Stop the playback of the alignment tape, then eject it.
9. To operate the maintenance mode, press the MENU button once.
10. To exit A30 : EQ VR, press the MENU button once.

6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

2. To exit the maintenance mode, press the MENU button four times.

7. Initial Data Setting (Another Video System)

When the EQ-75 board or NV-RAM (IC900/EQ-75 board) was replaced only, be sure to perform as follows:

1. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And switch the video system of the video monitor.
   DNW-A75 : 625/50 system (PAL)
   DNW-A75P : 525/60 system (NTSC)
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A3 : BETACAM PB ADJUST.
4. Set the following initial data to each item of the sub-menu (A30).
   DNW-A75 : Data on 625/50 column
   DNW-A75P : Data on 525/60 column

Item (A30 : EQ VR)	Initial data 525/60	625/50
RF GAIN METAL-Y-A	48	80
RF GAIN METAL-Y-B	48	80
RF GAIN METAL-C-A	48	80
RF GAIN METAL-C-B	48	80
RF GAIN OXIDE-Y-A	48	80
RF GAIN OXIDE-Y-B	48	80
RF GAIN OXIDE-C-A	48	80
RF GAIN OXIDE-C-B	48	80

5. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
6. To exit the maintanance mode, press the MENU botton four times.
7. Return the video system of the unit using the setup menu ITEM-013 :525/625 SYSTEM SELECT. And return the video system of the video monitor.
   DNW-A75 : 525/60 system (NTSC)
   DNW-A75P : 625/50 system (PAL)

2-6-4. Recording Current Adjustment

When the recording current adjustment is performed independently of the standard RF system alignment, be sure to see Section 2-6-4.
(Refer to Section "2-6-2. Betacam SX Format Overall RF System Adjustment" regarding the standard recording current adjustment in the RF system adjustment.)

Preparing tools

- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean with the cleaning tape.

Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.

- The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 4-2-9 of the maintenance manual part 1.

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Recording Current Adjustment

1. Insert the recording tape.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A12 : REC CURRENT in the maintenance mode.
   - Message "Auto Adjust (Push SET)" is displayed on the video monitor.
4. Check that there is the ∗ mark to "ALL" on the video monitor.
   If not, set the ∗ mark to "ALL" with the search dial turned.
5. To execute the automatic adjustment for the recording current, press the SET button once on the lower control panel.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

2-7. Audio System Adjustment

2-7-1. Adjustment Overview

In the audio system alignment for the VTR need to adjust the analog audio system only. For the digital audio system is not needed.

Tools List

To perform the audio system alignment for the VTR, prepare the following equipment and fixtures.

- Audio signal generator: TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension boards: EX-555 (Part No. A-8277-211-A) and
  EX-556 (Part No. A-8277-212-A)
- Shorting clip
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41) and
  CR8-1A (Part No. 8-960-097-45)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91),
  CR8-1A PS (Part No. 8-960-098-45), and
  CR8-1B PS (Part No. 8-960-096-86)
- Recorded SP tape: BCT-SP series (Betacam SP cassette: Sony's standard products)

  Note

  Be sure to prepare a Betacam SP cassette tape that recorded the no signal to the LAU tracks using a Betacam SP videocassette recorder in advance.
- Composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
2-7-3	Analog audio output (Line) adjustment (APR-40 board)			
	Output level adjustment	CH1	⊘RV500/APR-40	AUDIO OUTPUT CH1
		CH2	⊘RV600/APR-40	AUDIO OUTPUT CH2
		CH3	⊘RV700/APR-40	AUDIO OUTPUT CH3
		CH4	⊘RV800/APR-40	AUDIO OUTPUT CH4
		L	⊘RV900/APR-40	MONITOR OUTPUT L
		R	⊘RV1000/APR-40	MONITOR OUTPUT R

Continue

Continued

Section	Item (Section title)		Adjustment point	Measurement point
2-7-4	Analog audio offset adjustment (APR-40 board)			
	Offset level adjustment	CH1	⊘RV103/APR-40	TP1113/APR-40
		CH2	⊘RV203/APR-40	TP1113/APR-40
		CH3	⊘RV303/APR-40	TP1114/APR-40
		CH4	⊘RV403/APR-40	TP1114/APR-40
2-7-5	Analog audio input adjustment (APR-40 board)			
	1. Input level adjustment	CH1	⊘RV100/APR-40, ⊘RV101/APR-40	AUDIO OUTPUT CH1
		CH2	⊘RV200/APR-40, ⊘RV201/APR-40	AUDIO OUTPUT CH2
		CH3	⊘RV300/APR-40, ⊘RV301/APR-40	AUDIO OUTPUT CH3
		CH4	⊘RV400/APR-40, ⊘RV401/APR-40	AUDIO OUTPUT CH4
	2. Distortion rate adjustment	CH4	⊘RV402/APR-40	AUDIO OUTPUT CH4
		CH3	⊘RV302/APR-40	AUDIO OUTPUT CH3
		CH2	⊘RV202/APR-40	AUDIO OUTPUT CH2
		CH1	⊘RV102/APR-40	AUDIO OUTPUT CH1
2-7-6	LAU PB line adjustment (AU-260 board)			
	LAU Dolby level pre-adjustment	CH1	⊘RV104/AU-260	TP103/AU-260
		CH2	⊘RV204/AU-260	TP203/AU-260
	LAU PB level pre-adjustment	CH2	⊘RV205/AU-260	AUDIO OUTPUT CH2
		CH1	⊘RV105/AU-260	AUDIO OUTPUT CH1
	LAU PB freq. response adj.	CH1	⊘RV101/AU-260, ⊘RV100/AU-260 (OXIDE) (S100/AU-260)	AUDIO OUTPUT CH1
		CH2	⊘RV201/AU-260, ⊘RV200/AU-260 (OXIDE) (S200/AU-260)	AUDIO OUTPUT CH2
		CH2	⊘RV202/AU-260 (METAL) for DNW-A75P only	AUDIO OUTPUT CH2
		CH1	⊘RV102/AU-260 (METAL) for DNW-A75P only	AUDIO OUTPUT CH1
	LAU Dolby level adjustment	CH1	⊘RV104/AU-260	TP103/AU-260
		CH2	⊘RV204/AU-260	TP203/AU-260
	LAU PB level adjustment	CH2	⊘RV205/AU-260	AUDIO OUTPUT CH2
		CH1	⊘RV105/AU-260	AUDIO OUTPUT CH1
	LAU PB phase adjustment		⊘RV203/AU-260	AUDIO OUTPUT CH1/CH2
	TC insert cross-talk adjustment	CH1	⊘RV901/AU-260, ⊘RV902/AU-260	AUDIO OUTPUT CH1
		CH2	⊘RV904/AU-260, ⊘RV905/AU-260	AUDIO OUTPUT CH2
2-7-7	AFM PB line adjustment (AU-260 board)			
	AFM RF level adjustment		⊘RV500/AU-260	TP570/AU-260 TP580/AU-260
	AFM VCO control voltage check		⊘LV500/AU-260	TP502/AU-260
	AFM demodulate balance check	CH3	⊘RV600/AU-260	AUDIO OUTPUT CH3
		CH4	⊘RV700/AU-260	AUDIO OUTPUT CH4
	AFM PB level adjustment	CH3	⊘RV601/AU-260	AUDIO OUTPUT CH3
		CH4	⊘RV701/AU-260	AUDIO OUTPUT CH4

2-7-2. Common Preparation

Perform the settings (shorting plugs, control panels, setup menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the audio system alignment.

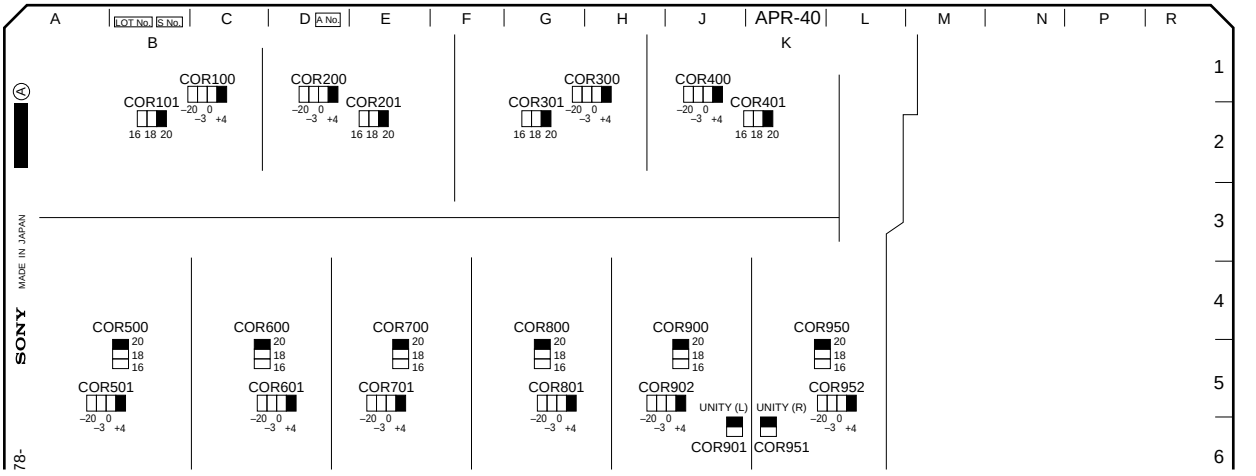
Shorting plugs setting

Reset the shorting plugs of APR-40 board to the factory settings.

Note

Turn off the power before removing the APR-40 board and changing the shorting plugs setting.

Ref. No. (Address)	Item	Customer setting	Factory setting
COR100 (C-1)	Analog audio CH1 input level		⇨ +4
COR101 (B-2)	Analog audio CH1 input headroom		⇨ 20
COR200 (D-1)	Analog audio CH2 input level		⇨ +4
COR201 (E-2)	Analog audio CH2 input headroom		⇨ 20
COR300 (H-1)	Analog audio CH3 input level		⇨ +4
COR301 (G-2)	Analog audio CH3 input headroom		⇨ 20
COR400 (J-1)	Analog audio CH4 input level		⇨ +4
COR401 (K-2)	Analog audio CH4 input headroom		⇨ 20
COR500 (B-5)	Analog audio CH1 output headroom		⇨ 20
COR501 (B-5)	Analog audio CH1 output level		⇨ +4
COR600 (C-5)	Analog audio CH2 output headroom		⇨ 20
COR601 (D-5)	Analog audio CH2 output level		⇨ +4
COR700 (E-5)	Analog audio CH3 output headroom		⇨ 20
COR701 (E-5)	Analog audio CH3 output level		⇨ +4
COR800 (G-5)	Analog audio CH4 output headroom		⇨ 20
COR801 (G-5)	Analog audio CH4 output level		⇨ +4
COR900 (J-5)	Monitor L output headroom		⇨ 20
COR901 (J-5)	Monitor L output level, fixed or variable		⇨ UNITY(L)
COR902 (H-5)	Monitor L output level		⇨ +4
COR950 (K-5)	Monitor R output headroom		⇨ 20
COR951 (K-5)	Monitor R output level, fixed or variable		⇨ UNITY(R)
COR952 (K-5)	Monitor R output level		⇨ +4



APR-40 Board (Side A)

2. Others settings

Location	Item		Customer setting	Setting at adjustment
SS-83 board	DIP switch S1100 (M-1)	No. 1	_____	⇨ ON (Set to the up position)
	Note Set to ON to treat the extended menu of the setup menu.			
Upper control panel	PB (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	REC (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	AUDIO INPUT SELECT		_____	⇨ ANALOG/AES/EBU
	REMOTE	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	CHARACTER switch		_____	⇨ ON
	DOLBY NR switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF
Connector panel	AUDIO INPUT CH1 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH2 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH3 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH4 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)

3. Video system check

Be sure to adjust in the following system.
DNW-A75: 525/60 system
DNW-A75P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

4. Setup extended menu setting

Item	Customer setting	Setting at adjustment
817 : EMPHASIS	_____	⇨ OFF

2-7-3. Analog Audio Output Line Adjustment (APR-40 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio analyzer through the power for 20 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C23 : AUDIO TEST SG of the maintenance mode, select "1KHz SINE 0VU" as test signal.
3. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV500/APR-40(B-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

6. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV600/APR-40(C-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH3 adjustment

8. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
9. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV700/APR-40(F-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

10. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV800/APR-40(F-5)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

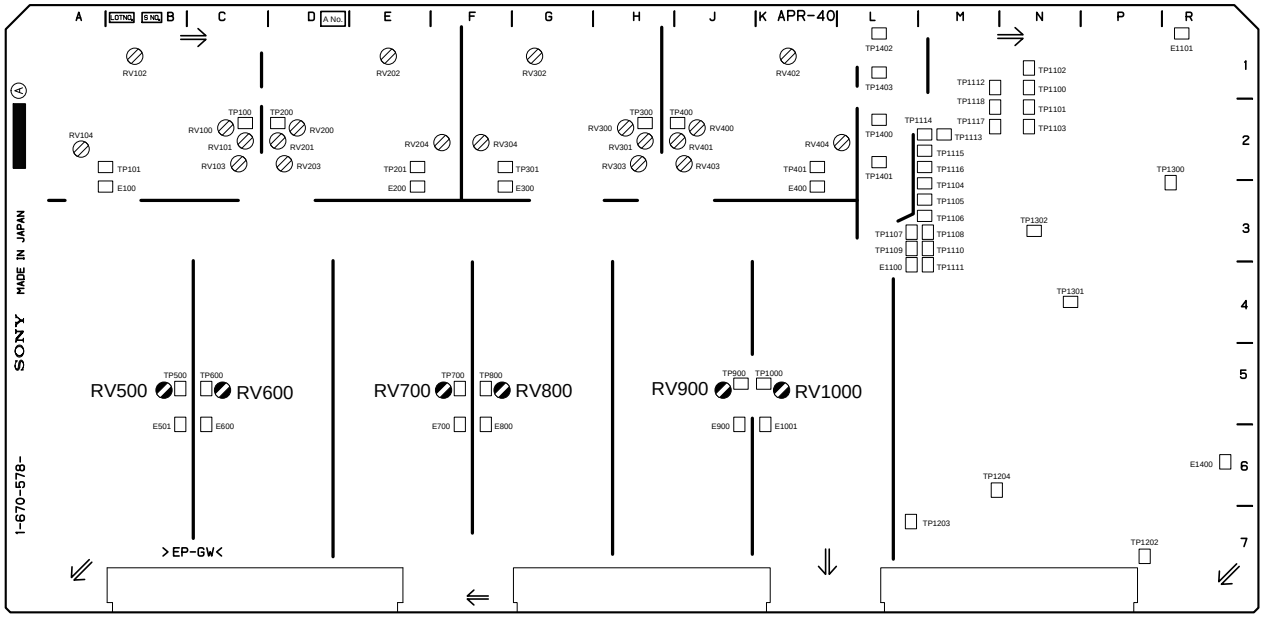
L channel adjustment

12. Connect the audio analyzer's input to MONITOR OUTPUT L connector.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV900/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

R channel adjustment

14. Connect the audio analyzer's input to MONITOR OUTPUT R connector.
15. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV1000/APR-40(J-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

16. To exit the maintenance mode, press the MENU button once.



APR-40 Board (Side A)

2-7-4. Analog Audio Offset Adjustment (APR-40 Board)

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-40 board are factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting of the setup extended menu.

ITEM-817 : EMPHASIS ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

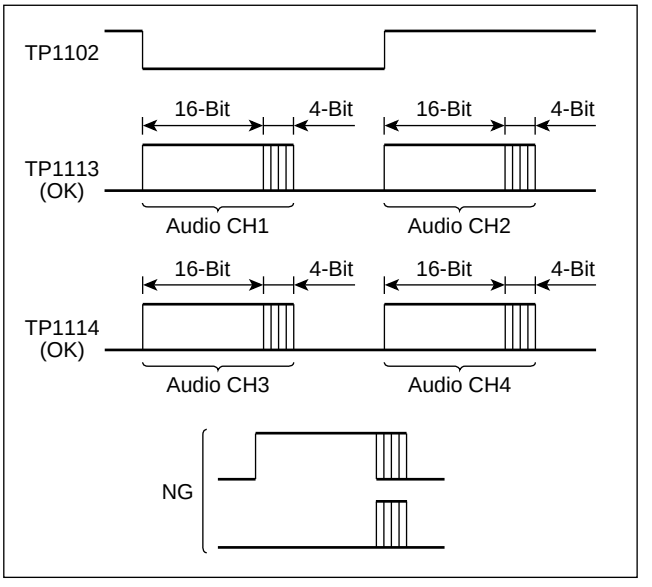


Figure 1. Waveform of Offset Level Adjustment

Offset Level Adjustment

CH1 adjustment

1. Short-circuit TP101(B-2) and E100(B-3) on the APR-40 board with a shorting clip.
2. Set and connect the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP1113/APR-40(M-2), DC 5 V/DIV
   GND: E1101/APR-40(R-1)
   CH-2: TP1102/APR-40(N-1), DC 5 V/DIV
   TIME: 2 μs/DIV
   TRIG: CH-2, − slope
3. Adjust so that audio CH1 part of the waveform at TP1113 makes the same waveform to the Figure 1 (left side).
   Adj. point: ⊘RV103/APR-40(C-2)
4. Remove the shorting clip on the APR-40 board.

CH2 adjustment

5. Short-circuit TP201(E-3) and E200(F-3) on the APR-40 board with a shorting clip.
6. Change the oscilloscope's trigger to the + slope.
7. Adjust so that audio CH2 part of the waveform at TP1113 makes the same waveform to the Figure 1 (right side).
   Adj. point: ⊘RV203/APR-40(D-2)
8. Remove the shorting clip on the APR-40 board.

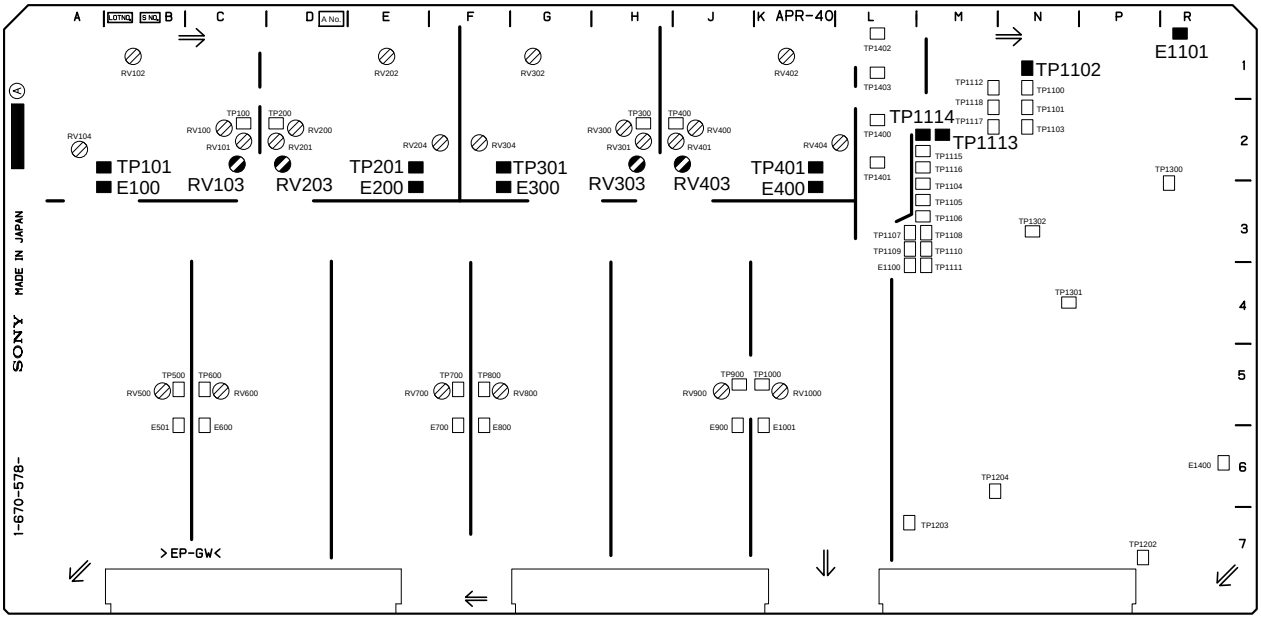
CH3 adjustment

9. Short-circuit TP301(G-2) and E300(G-3) on the APR-40 board with a shorting clip.
10. Change the connection of the oscilloscope as follows:
    CH1: TP1114/APR-40(M-2)
11. Change the oscilloscope's trigger to the − slope.
12. Adjust so that audio CH3 part of the waveform at TP1114 makes the same waveform to the Figure 1 (left side).
    Adj. point: ⊘RV303/APR-40(H-2)
13. Remove the shorting clip on the APR-40 board.

CH4 adjustment

14. Short-circuit TP401(K-2) and E400(K-3) on the APR-40 board with a shorting clip.
15. Change the oscilloscope's trigger to the + slope.
16. Adjust so that audio CH4 part of the waveform at TP1114 makes the same waveform to the Figure 1 (right side).
    Adj. point: ⊘RV403/APR-40(J-2)
17. Remove the shorting clip on the APR-40 board.

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APR-40 Board (Side A)

2-7-5. Analog Audio Input Line Adjustment (APR-40 Board)

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET
REC (audio level) controls: All CHs ⇨ PRESET
AUDIO INPUT SELECT ⇨ ANALOG

4. Check the setting of the setup extended menu.

ITEM-817: EMPHASIS ⇨ OFF

5. Check the settings on the connector panel.

AUDIO INPUT LEVEL switches:
All CHs ⇨ HIGH/ON 600Ω (right position)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Input Level Adjustment

1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

2. Short-circuit TP100(C-2) and E100(A-3) on the APR-40 board with the shorting clip.
3. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH1 connector.
4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV100/APR-40(C-2)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)
6. Remove the shorting clip on the APR-40 board.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV101/APR-40(C-2)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

8. Short-circuit TP200(D-2) and E200(E-3) on the APR-40 board with a shorting clip.
9. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH2 connector.
10. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV200/APR-40(D-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
12. Remove the shorting clip on the APR-40 board.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV201/APR-40(D-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH3 adjustment

14. Short-circuit TP300(H-2) and E300(F-3) on the APR-40 board with a shorting clip.
15. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH3 connector.
16. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
17. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV300/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
18. Remove the shorting clip on the APR-40 board.
19. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV301/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

20. Short-circuit TP400(J-2) and E400(K-3) on the APR-40 board with a shorting clip.
21. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH4 connector.
22. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
23. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV400/APR-40(J-2)
    Specification: +4.0 ± 0.1 dBm (at 600 Ω load)
24. Remove the shorting clip on the APR-40 board.
25. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV401/APR-40(J-2)
    Specification: +4.0 ± 0.1 dBm (at 600 Ω load)

2. Distortion Rate Adjustment

1. Set the audio analyzer as follows:
   Function mode: THD+N
   Range: 2%
   Input filter: 80 kHz LPF

CH4 adjustment

2. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH4 connector.
3. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
4. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV402/APR-40(K-1)
   Specification: Minimize (0.10% or less: OK)

CH3 adjustment

5. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH3 connector.
6. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
7. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV302/APR-40(G-1)
   Specification: Minimize (0.10% or less: OK)

CH2 adjustment

8. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH2 connector.
9. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
10. Adjust the distortion rate on the audio analyzer.
    Adj. point: ⊘RV202/APR-40(E-1)
    Specification: Minimize (0.10% or less: OK)

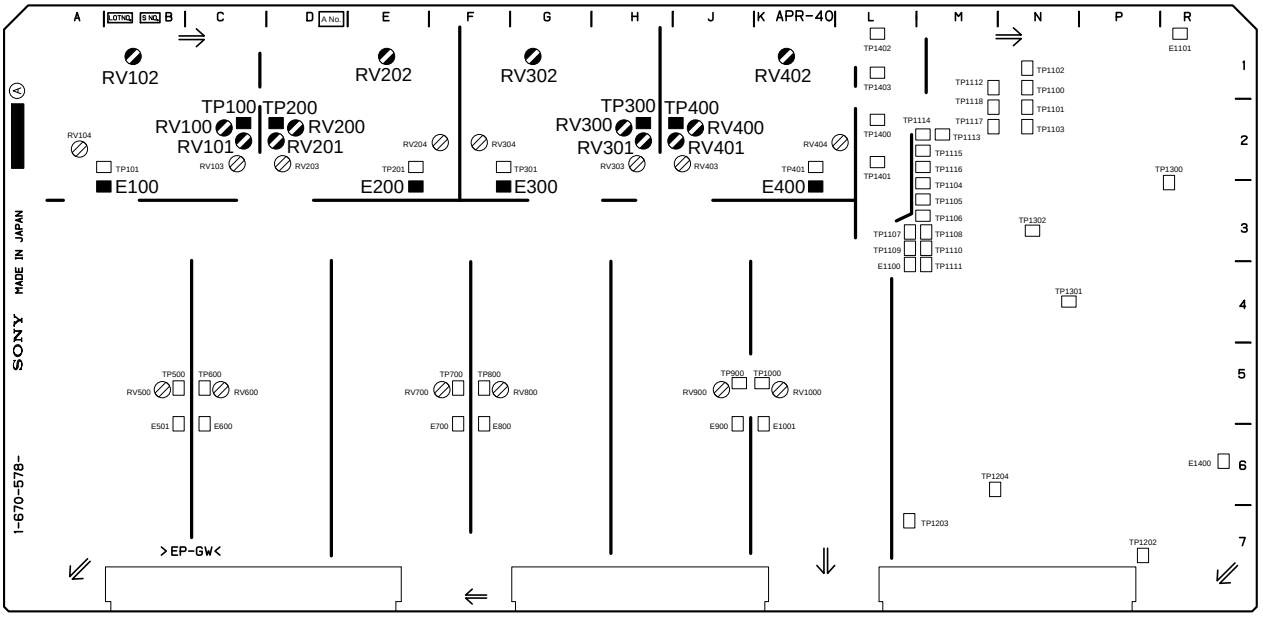
CH1 adjustment

11. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH1 connector.
12. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
13. Adjust the distortion rate on the audio analyzer.
    Adj. point: ⊘RV102/APR-40(B-1)
    Specification: Minimize (0.10% or less: OK)

14. Stop the extending of the APR-40 board.

Note

After turnning off the power, remove the board.



APR-40 Board (Side A)

2-7-6. LAU PB Line Adjustment (AU-260 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Alignment tape(s)
  For DNW-A75: CR8-1A (Part No. 8-960-097-45)
  For DNW-A75P: CR8-1A PS (Part No. 8-960-098-45)
  and CR8-1B PS (Part No. 8-960-096-86)
- Recorded SP tape: BCT-SP series (Betacam SP cassette: Sony's standard products)

Note

Be sure to prepare a Betacam SP cassette tape that recorded the no signal to the LAU tracks using a Betacam SP videocassette recorder in advance.

- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the AU-260 board with an extension board EX-556.

Note

After turning off the power, then remove the AU-260 board.

3. Clean the AT head.

Clean the tape running surface of the AT head. (Refer to "5-2-5. Stationary Heads Cleaning" of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

4. Check the settings on the upper control panel.

PB (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

DOLBY NR switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

6. Check the video system.

Check that the operation system is setting as follows:
DNW-A75: 525/60 system
DNW-A75P: 625/50 system.
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

8. Check the setting of the setup extended menu.

ITEM-817: EMPHASIS ⇨ OFF

9. Set the setup extend menu ITEM-F01 to "SW". (For the DNW-A75P only)

Notes

- To display the ITEM-F00 series, turn the search dial with the PLAY button pressing.
- Return the ITEM-F01 : AUDIO NR IN SP MODE to "ON" after the LAU PB system adjustment are completed.

1. LAU Dolby Pre-adjustment

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A75: CR8-1A
   For DNW-A75P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E200/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the alignment tape CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV204/AU-260(E-2)
   Specification: −10.0 ±0.5 dBu (0 dBu ≒ 0.775 V rms)

2. LAU PB Level Pre-adjustment

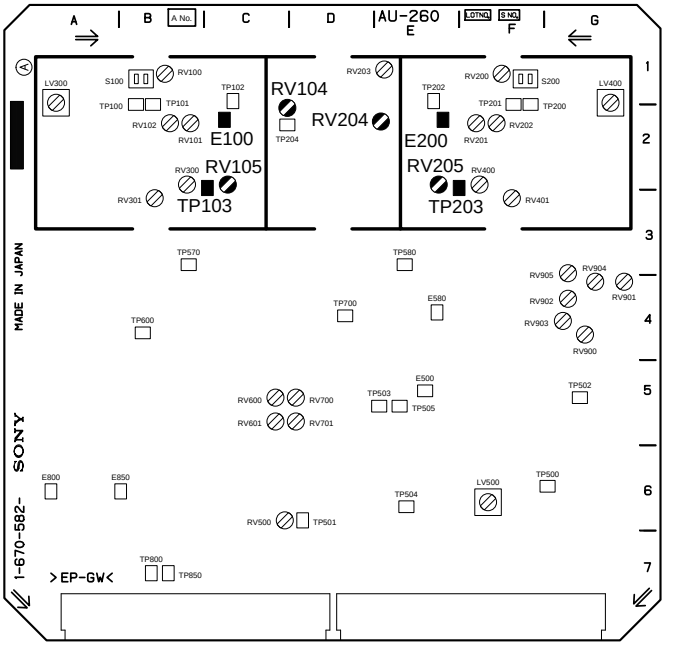
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A75: CR8-1A
   For DNW-A75P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV205/AU-260(E-2)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV105/AU-260(C-2)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)



AU-260 Board (Side A)

3. LAU PB Frequency Response Adjustment

1. Set the audio analyzer as follows:
   Function mode: dB RATIO
   Input filter: 80 kHz LPF

CH1 adjustment (OXIDE)

2. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
3. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the following alignment tape in PLAY mode, measure the audio level on the audio analyzer.
   For DNW-A75: CR8-1A
   For DNW-A75P: CR8-1A PS
   This measured audio level is a reference level (0 dB).
4. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV100 adjustment is not satisfied, readjust after changing the setting of S100(B-1) on the AU-260 board.

CH2 adjustment (OXIDE)

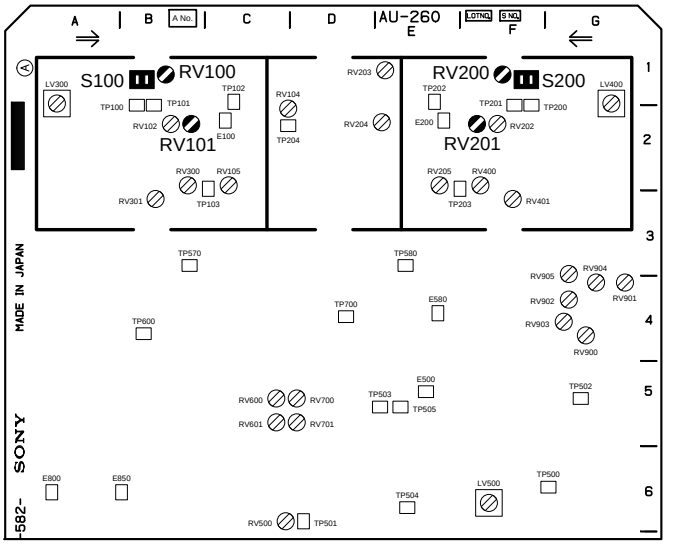
5. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
6. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
7. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV200 adjustment is not satisfied, readjust after changing the setting of S200(F-1) on the AU-260 board.

Playback portion	Specification [dB] DNW-A75	DNW-A75P	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).		—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	C.V. ±0.4	CH-1: ⊘RV101/AU-260 (B-2) CH-2: ⊘RV201/AU-260 (F-2)
7:00 to 7:25 (10 kHz)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{+1.0}_{-1.7}$	CH-1:⊘RV100/AU-260 (B-1) CH-2:⊘RV200/AU-260 (F-1)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

CH1 adjustment (METAL) for DNW-A75P only

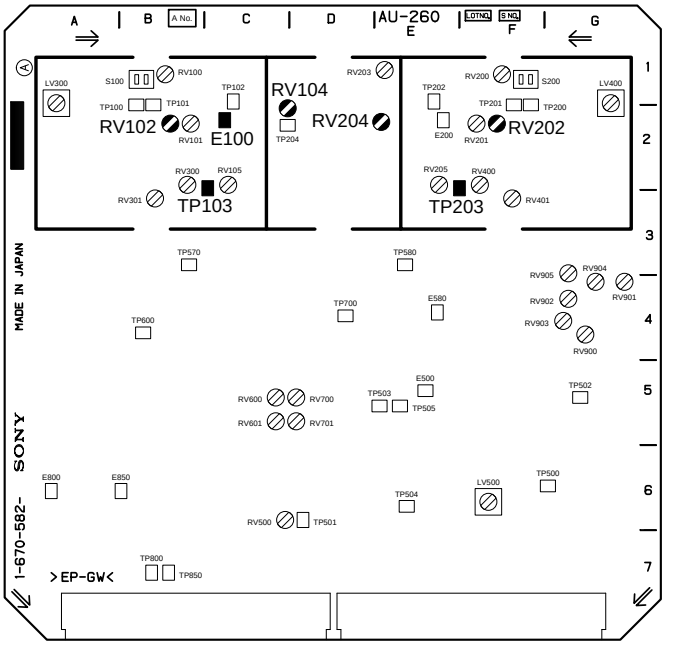
8. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
9. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the alignment tape CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
10. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

CH2 adjustment (METAL) for DNW-A75P only

11. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
12. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
    This measured audio level is a reference level (0 dB).
13. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

Playback portion	Specification [dB]	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).	—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. ±0.5	CH-1: ⊘RV102/AU-260(B-2) CH-2: ⊘RV202/AU-260(F-2)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

4. LAU Dolby Level Adjustment

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A75: CR8-1A
   For DNW-A75P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E100/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV204/AU-260(E-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

5. LAU PB Level Adjustment

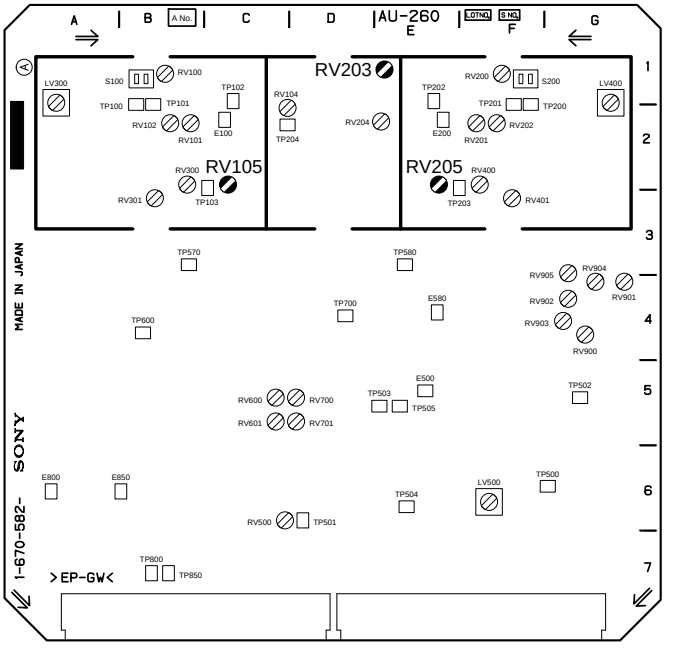
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A75: CR8-1A
   For DNW-A75P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV205/AU-260(E-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV105/AU-260(C-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

6. LAU PB Phase Adjustment

1. Connect and set the oscilloscope as follows:
   X-Y mode
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector
   GND: Pin 1 (G) of it, AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector
   GND: Pin 1 (G) of it, AC

   Note

   An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors.
   Prepare two XLR-to-pigtail cables for this adjustment. And connect the XLR plug end of the cable to above-mentioned connectors and the pigtailed end to the oscilloscope. The cables for CH-1 and CH-2 shall be the same in length and same wire color on the pigtailed end.
2. For DNW-A75: Play back the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A in PLAY mode.
   For DNW-A75P: Play back the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS in PLAY mode.
3. Watch the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adj. point: ◓RV203/AU-260(E-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 2.)

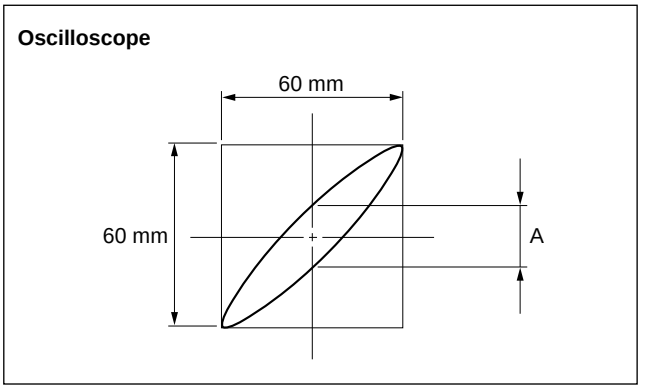


Figure 2. Lissajous Waveform of LAU PB Phase Adjustment

7. TC Insert Cross-talk Adjustment

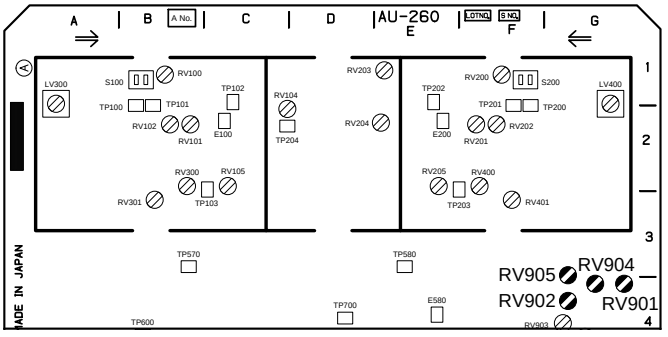
1. Open the AUDIO INPUT CH1 and CH2 connectors.
2. Insert the Betacam SP cassette tape that recorded the no signal to the LAU tracks.
3. Set the audio analyzer as follows:
   Function mode: LEVEL
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Press the INSERT TIME CODE button on the lower control panel.
6. Press the PLAY button while pressing the EDIT button.
7. Adjust the cross-talk level on the audio analyzer. (Alternately adjust the following adj. points.)
   Adj. points: ⊘RV901/AU-260(G-4)
   ⊘RV902/AU-260(G-4)
   Specification: Minimize
   (The level should be less than −18 dBu)
8. Stop the recording.

CH2 adjustment

9. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
10. Press the INSERT TIME CODE button on the lower control panel.
11. Press the PLAY button while pressing the EDIT button.
12. Adjust the cross-talk level on the audio analyzer. (Alternately adjust the following adj. points.)
    Adj. points: ⊘RV904/AU-260(G-4)
    ⊘RV905/AU-260(G-4)
    Specification: Minimize
    (The level should be less than −18 dBu)
13. Stop the recording, then eject the cassette tape.



AU-260 Board (Side A)

2-7-7. AFM PB Line Adjustment (AU-260 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the AU-260 board with an extension board EX-556.

Note

After turning off the power, then remove the AU-260 board.

3. Clean with the cleaning tape.

Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.

- The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.

4. Check the settings on the upper control panel.

PB (audio level) controls: CH3 ⇨ PRESET
CH4 ⇨ PRESET
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

DOLBY NR switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

6. Check the video system.

Check that the operation system is setting as follows:
DNW-A75: 525/60 system
DNW-A75P: 625/50 system.
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

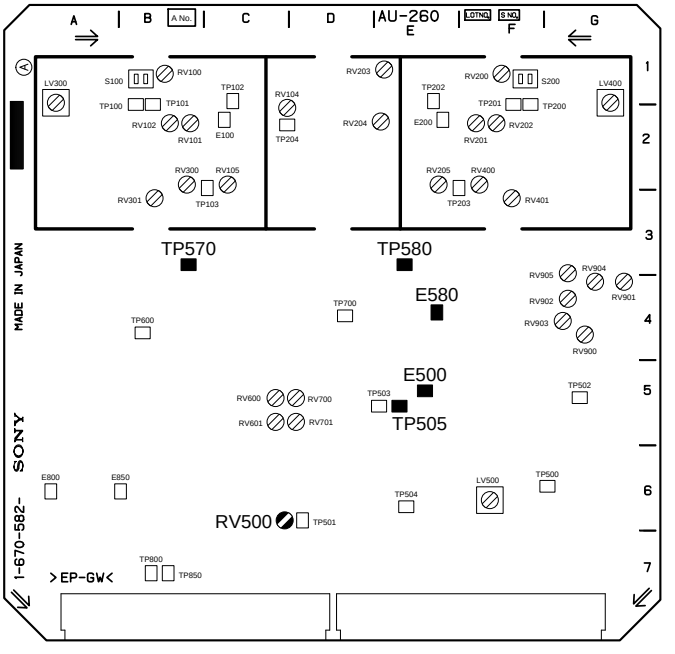
8. Check the setting of the setup extended menu.

ITEM-817: EMPHASIS ⇨ OFF

9. Set the setup extend menu ITEM-F01 to "SW". (For the DNW-A75P only)

Notes

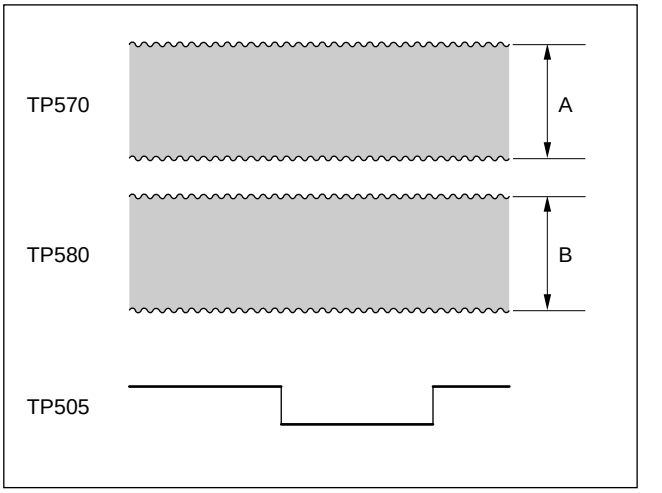
- To display the ITEM-F00 series, turn the search dial with the PLAY button pressing.
- Return the ITEM-F01 : AUDIO NR IN SP MODE to "ON" after the LAU PB system adjustment are completed.



AU-260 Board (Side A)

1. AFM RF Level Adjustment

1. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP570/AU-260(B-3) ,
   GND: E580/AU260(E-4)
   CH-2: TP580/AU-260(E-3) ,
   GND: E500/AU260(E-5)
   TRIG: TP505/AU-260(E-5) ,
   GND: E500/AU260(E-5)
   TIME: 5 ms/DIV
2. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the following alignment tape in PLAY mode.
   For DNW-A75: CR5-1B
   For DNW-A75P: CR5-1B PS
3. Check the RF levels of waveforms on the oscilloscope. If the speification is not satisfied, adjustment.
   Adj. point: ⊘RV500/AU-260(C-6)
   Specifications: A = 450 ±100 mV p-p
   B = 450 ±100 mV p-p



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2. AFM VCO Control Voltage Check

1. Connect and set the oscilloscope as follows:
   CH-1: TP502/AU-260(G-5) ,
   GND: E580/AU260(E-4)
2. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
3. Check the DC level using the oscilloscope.
   If the specification is not satisfied, adjust it.
   Adj. point: ⊘LV500/AU-260(F-6)
   Specifications: 2.0 ± 0.1 V p-p

3. AFM Demodulate Balance Check

1. Set the audio analyzer as follows:
   Function mode: THD +N
   Range: 2 %
   Input filter: 80 kHz LPF

CH3 check

2. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
3. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
4. Check the distortion rate on the audio analyzer.
   Adj. point: ⊘RV600/AU-260(C-5)
   Specifications: Minimize (0.45 % or less: OK)

CH4 check

5. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
6. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
7. Check the distortion rate on the audio analyzer.
   Adj. point: ⊘RV700/AU-260(D-5)
   Specifications: Minimize (0.45 % or less: OK)

4. AFM PB Level Adjustment

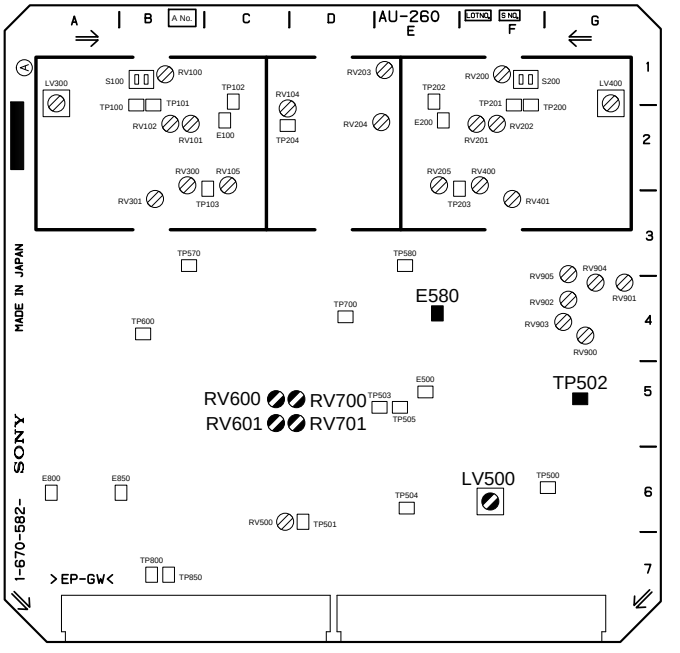
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH4 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
3. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the following alignment tape in PLAY mode.
   For DNW-A75: CR5-1B
   For DNW-A75P: CR5-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV701/AU-260(D-5)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH3 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
6. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV601/AU-260(C-5)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

2-8. Video System Alignment (VPR-47 Board)

2-8-1. Adjustment Overview

Section 2-8 explains the alignment of the following in the video system.
- Reference signal system
- Video processing system
- Analog video output line

The adjustments are the manually adjustments using the menu of the maintenance mode.
When the VPR-47 board was replaced or repaired, perform the video system alignment.

Notes

- In the DNW-A75, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-A75P, be sure to adjust in 625/50 system before 525/60 system.
- In the video system alignment, be sure to adjust without the extension board.
- For the video system of the analog Betacam PB, refer to Section 2-11.
- For the composite video input line and component video input line, refer to Section 2-9.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

In Section 2-8, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-A75	DNW-A75P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video system alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generators (Sign is SG1.)
  - For 525/60 system: TEKTRONIX TSG-170A or equivalent
  - For 625/50 system: TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generators (Sign is SG2.)
  - For 525/60 system: TEKTRONIX 1410 or equivalent
  - For 625/50 system: TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitors
  - For 525/60 system: TEKTRONIX 1750, 1780R, or equivalent
  - For 625/50 system: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Analog composite video monitor (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)
- 75 Ω BNC T adapter

Adjustment Items

Section	Item	Adjustment point	Remarks
2-8-2	Preparation in standard system		DNW-A75: 525/60 system DNW-A75P: 625/50 system
2-8-3	Composite video output level adjustment		
	CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
	CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
	Data save	A2F : NV-RAM CONTROL	
2-8-4	Component video output adjustment		
	Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
	R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
	Output phase check		VIDEO OUTPUT COMPONENT
2-8-5	Component video output (Betacam) level adjustment		For 525/60 system only
	R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
2-8-6	Reference color frame pulse check		If the specification is not satisfied, change the adjustment data.
		A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
	Data save	A2F : NV-RAM CONTROL	
2-8-7	Internal 4fsc frequency adjustment		
		A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
	Data save	A2F : NV-RAM CONTROL	
2-8-8	Preparation in another system		DNW-A75: 625/50 system DNW-A75P: 525/60 system
2-8-9	Composite video output level adjustment		
	CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
	CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
	Data save	A2F : NV-RAM CONTROL	
2-8-10	Component video output adjustment		
	Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
	R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
	Output phase check		VIDEO OUTPUT COMPONENT
2-8-11	Component video output (Betacam) level adjustment		For DNW-A75P only
	R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
2-7-12	Reference color frame pulse check		If the specification is not satisfied, change the adjustment data.
		A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
	Data save	A2F : NV-RAM CONTROL	

Continue

Continued

Section	Item	Adjustment point	Remarks
2-8-13	Internal 4fsc frequency adjustment		
		A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
	Data save	A2F : NV-RAM CONTROL	
2-8-14	Perfaction in video system alignment		

2-8-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item	Customer setting		Setting at adjustment
SS-83 board	DIP switch S1100-1 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.	_____	⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch	_____	⇨	ON
	PROCESS CONTROL switch	_____	⇨	LOCAL
	• VIDEO switch	_____	⇨	PRESET
	• CHROMA switch	_____	⇨	PRESET
	• SET UP or BLACK LEVEL switch	_____	⇨	PRESET
	• Y/C DELAY switch	_____	⇨	PRESET
	• CHROMA PHASE switch	_____	⇨	PRESET
Connector panel	REF. VIDEO 75 Ω switch	_____	⇨	OFF (Set to the down position)

2. Set the following mode of the analog composite monitor.
   DNW-A75: NTSC
   DNW-A75P: PAL
3. Check that the video system is setting as follows:
   DNW-A75: 525/60 system
   DNW-A75P: 625/50 system
   If differed, change the video system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-A75 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	_____	⇨	0.0%
	3. BETACAM PB LEVEL	_____	⇨	MSTER
	4. OUTPUT LEVEL	_____	⇨	MSTER

5. When extending the VPR-47 board with an extension board, stop the extending.
   Note
   If stopping the extension to the VPR-47 board, turn off the power, then remove the VPR-47 board.

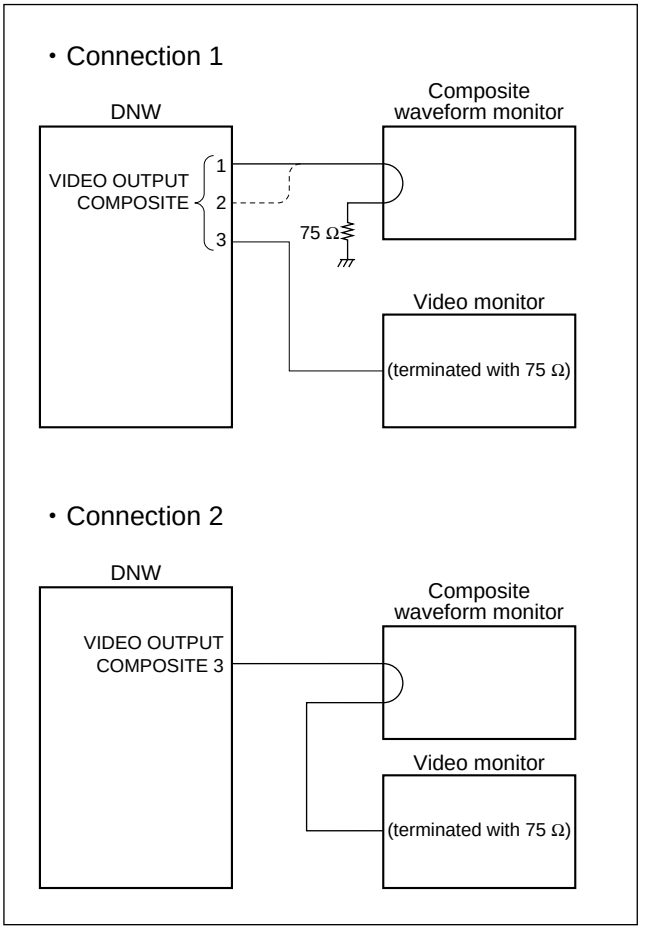
2-8-3. Composite Video Output Adjustment (Standard System)

Note

For the composite video output adjustment in the another system, refer to Section 2-8-9.

Preparing tools

- Analog composite waveform monitor
  For DNW-A75:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A75P:
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite waveform monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A75 only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A75: 75% Color Bars
   DNW-A75P: 100% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes

   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

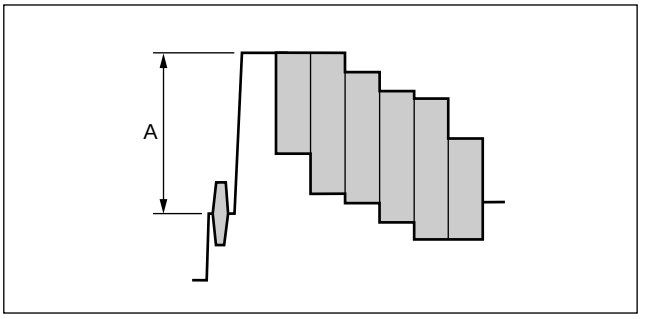
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

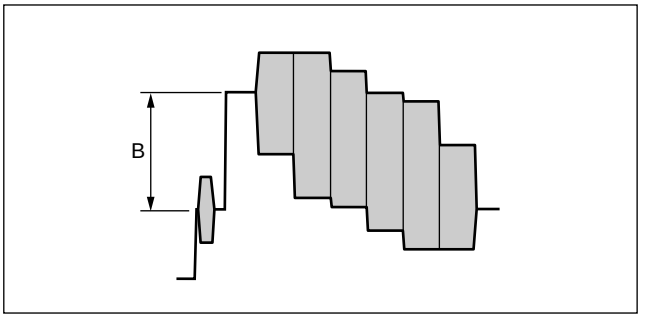
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification DNW-A75	Specification DNW-A75P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	A = 100 ±1 IRE	B = 700 ±7 mV
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL	(A = 714 ±7 mV)	
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A75 (525/60 System)



DNW-A75P (625/50 System)

2-8-4. Component Video Output Adjustment (Standard System)

Note

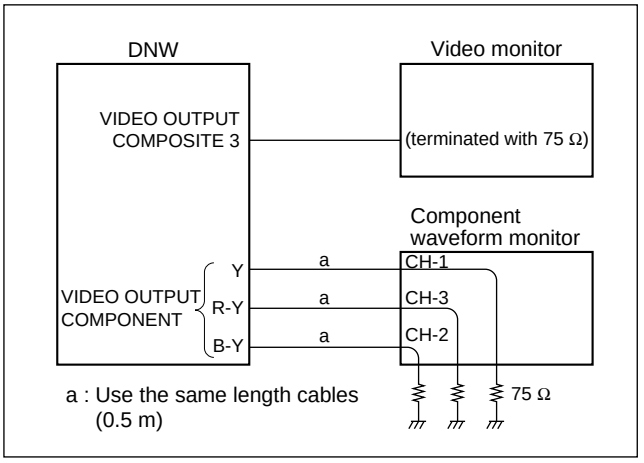
For the composite video output adjustment in the another system, refer to Section 2-8-10.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A75 only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  0. MASTER LEVEL ⇨ 0.0%
  4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

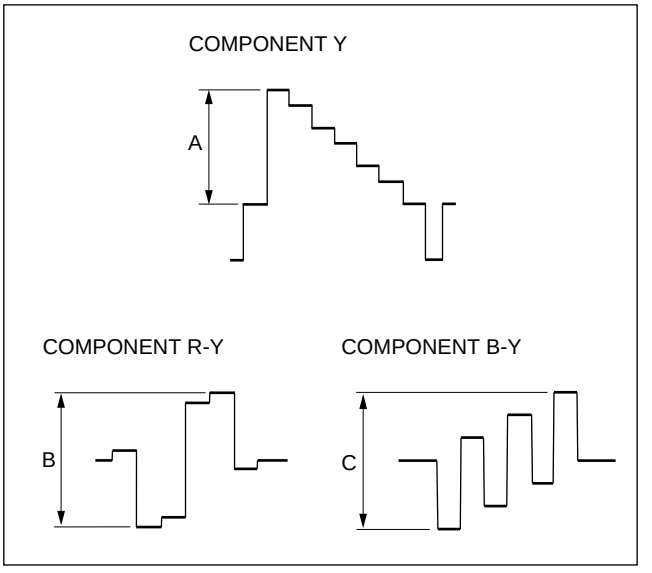
1. Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs on the waveform monitor. If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over steps 7 and 8.

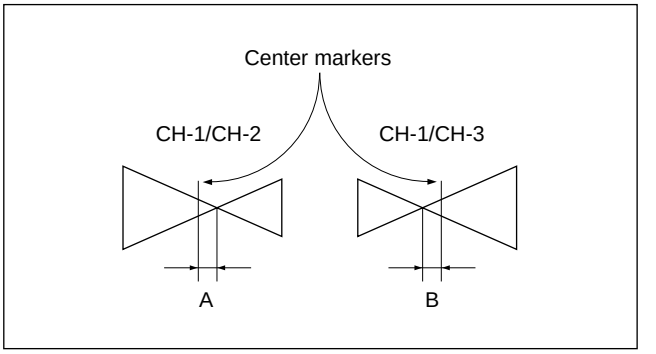
7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2. Output Phase Check

1. To exit the A2 : AUDIO/VIDEO ADJUST, press the MENU button once.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “Bowtie”.
3. Set the analog component waveform monitor to the BOWTIE mode.
4. Check the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns



5. To exit the maintenance mode, press the MENU button four times.

2-8-5. Component Video Output (Betacam) Adjustment (525/60 System)

Notes

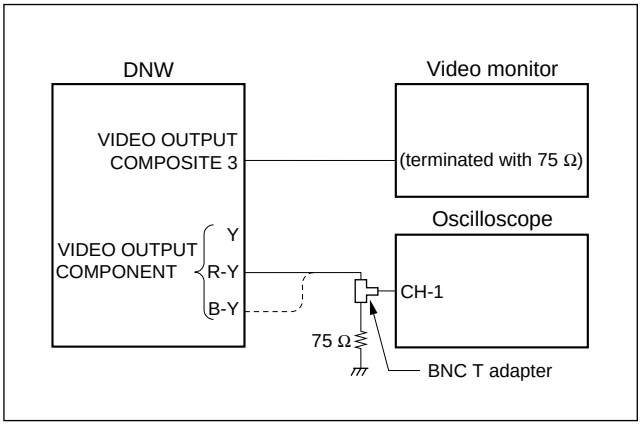
- Be sure to perform this adjustment when the VTR operates in the 525/60 system.
- For the DNW-A75P, be sure to perform this adjustment after Section 2-8-10 is completed.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminator
- 75 Ω BNC T adapter



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the oscilloscope as shown Figure "Connection".

4. Check the setup extend menu settings.

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MATER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

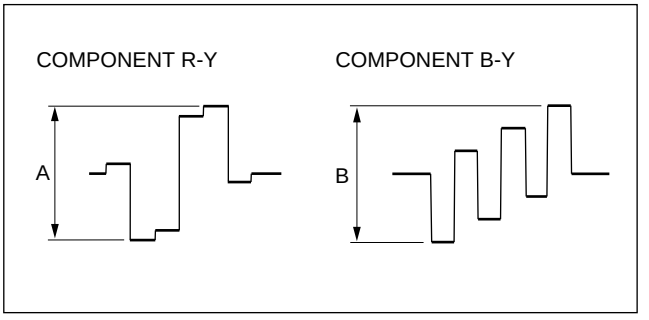
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “75% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: DC 100 mV/DIV
   TIME: 10 μs/DIV
   TRIG: CH-1
6. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT R-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : R-Y OUTPUT LEVEL
   Specification: A = 757 ±7 mV p-p
7. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT B-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : B-Y OUTPUT LEVEL
   Specification: B = 757 ±7 mV p-p



8. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in both step 6 and step 7, skip over to step 11.

9. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A2F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

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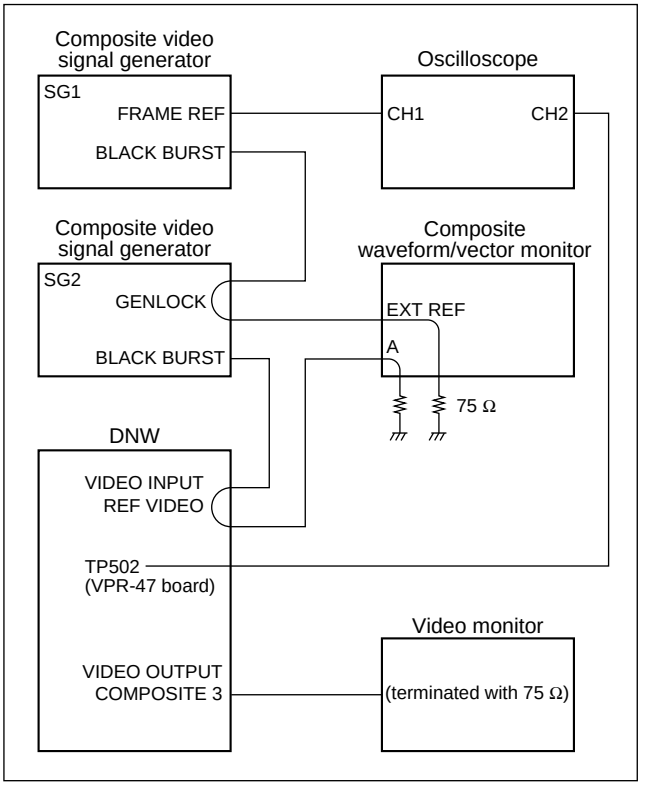
2-8-6. Reference Color Frame Pulse Check (Standard System)

Note

For the reference color frame pulse check in another system, refer to Section 2-8-12.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A75:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A75P:
  TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A75:
  TEKTRONIX 1410 or equivalent
  For DNW-A75P:
  TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A75:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A75P:
  TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

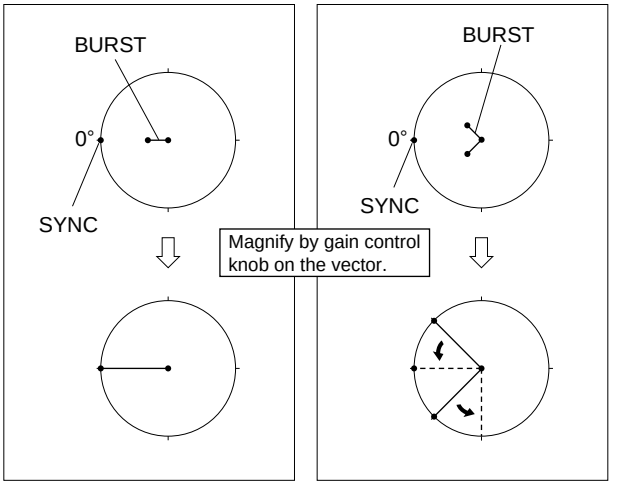
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

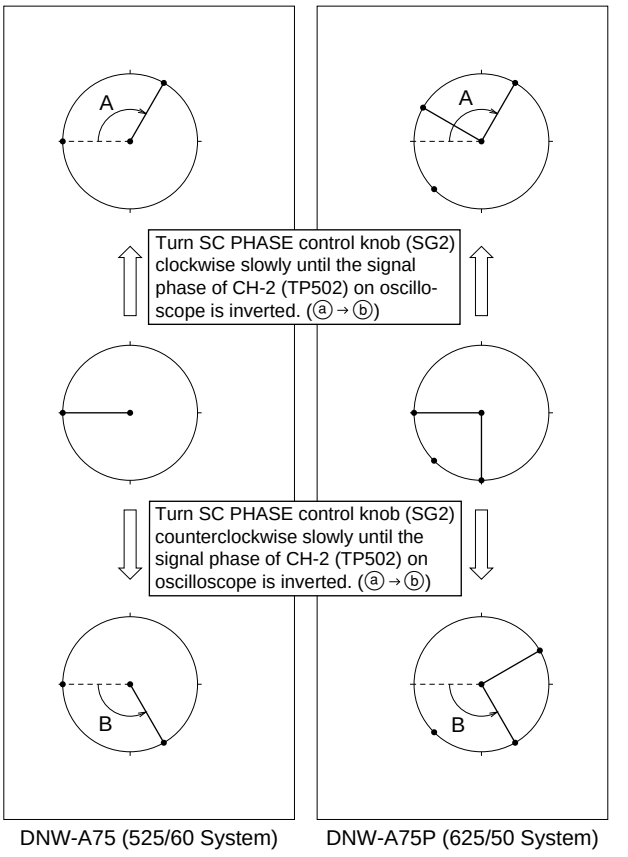
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-A75P only
   Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

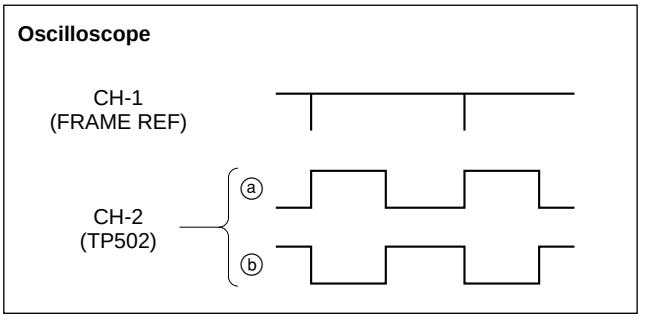


DNW-A75 (525/60 System) DNW-A75P (625/50 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20: VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 10 ms/DIV for DNW-A75
   20 ms/DIV for DNW-A75P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: A − B = 0 ±10°
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscillo-scope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-A75 (525/60 System)
DNW-A75P (625/50 System)



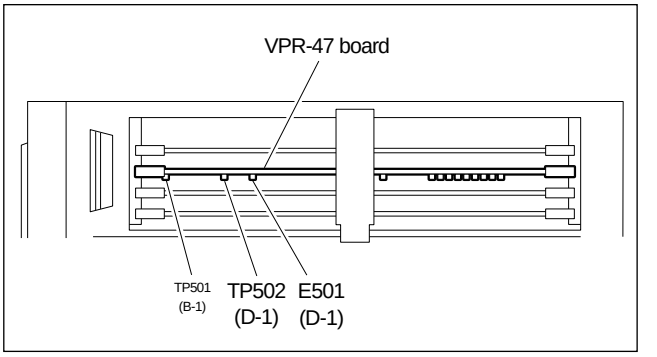
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2-8-7. Internal 4fsc Frequency Adjustment (Standard System)

Note

For the internal 4fsc frequency adjustment in another system, refer to Section 2-8-13.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification:
   14,318,181 ±50 Hz for DNW-A75
   17,734,476 ±50 Hz for DNW-A75P
5. To exit A20 : VPR VR, press the MENU button once.

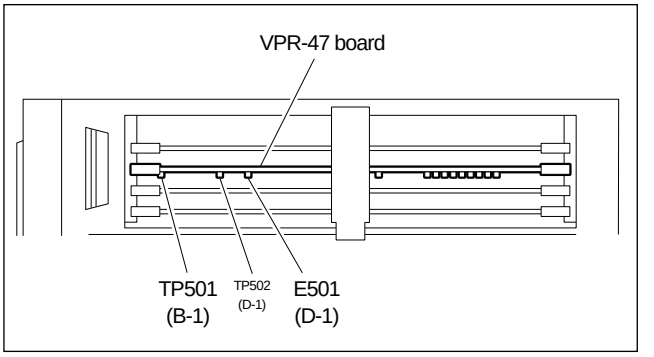
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



2-8-8. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-A75

1. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-8-2.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
3. Set the analog composite monitor to the PAL mode.

For the DNW-A75P

1. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
2. Set the analog composite monitor to the NTSC mode.
3. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT			
1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL			
0. MASTER LEVEL	_____	⇨	0.0%
3. BETACAM PB LEVEL	_____	⇨	MSTER
4. OUTPUT LEVEL	_____	⇨	MSTER

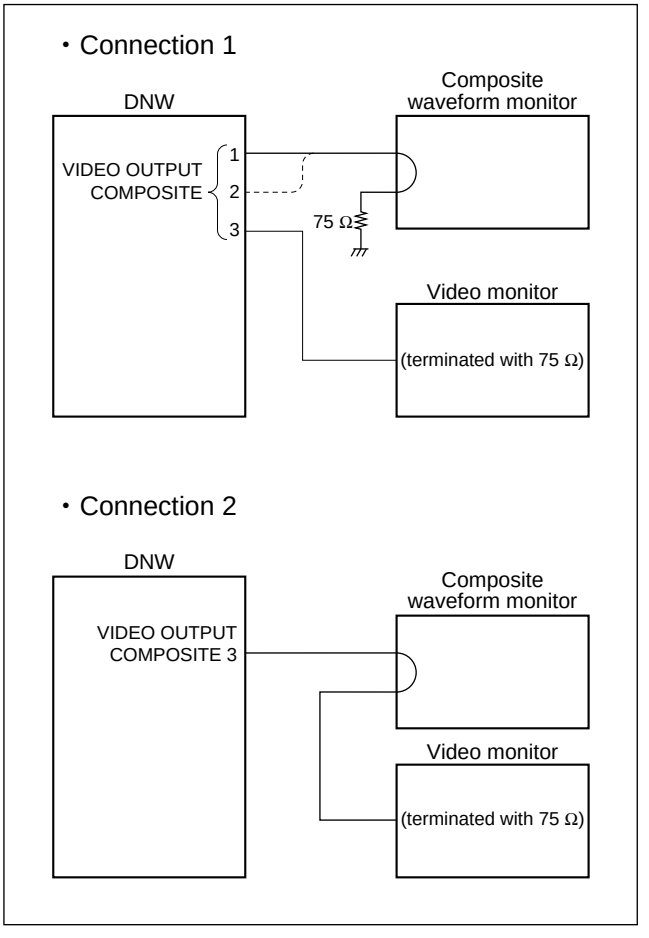
2-8-9. Composite Video Output Adjustment (Another System)

Note

For the composite video output adjustment in the standard system, refer to Section 2-8-3.

Preparing tools

- Analog composite waveform monitor
  For DNW-A75:
  TEKTRONIX 1751, 1781R or equivalent
  For DNW-A75P:
  TEKTRONIX 1750, 1780R or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A75P only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A75: 100% Color Bars
   DNW-A75P: 75% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes

   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment in step 5 was not performed, skip over to step 9.

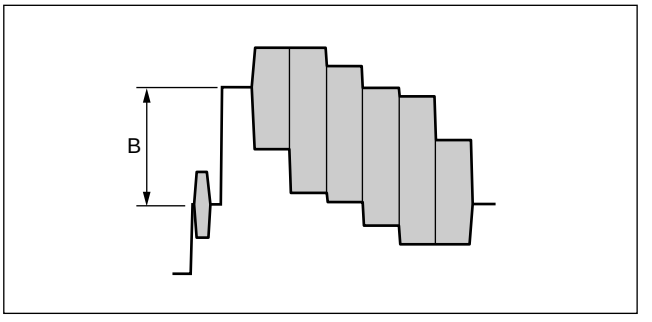
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

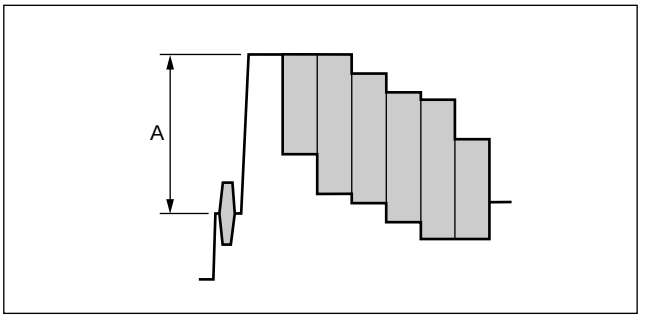
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification DNW-A75	Specification DNW-A75P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	B = 700 ±7 mV	A = 100 ±1 IRE
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL		(A = 714 ±7 mV)
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A75 (625/50 System)



DNW-A75P (525/60 System)

2-8-10. Component Video Output Adjustment (Another System)

Note

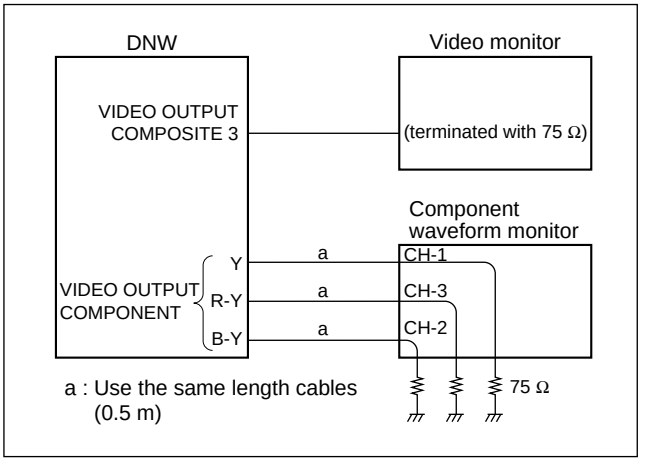
For the composite video output adjustment in the standard system, refer to Section 2-8-4.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector on the connector panel.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A75P only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

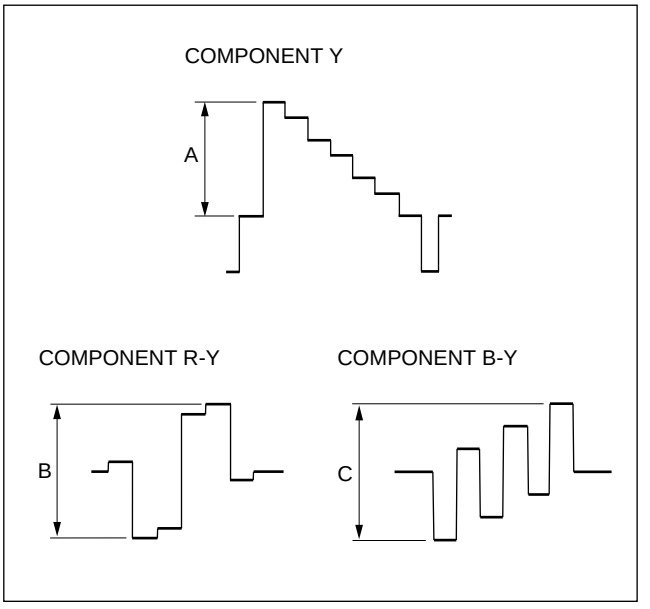
Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs (Y/R-Y/B-Y) on the waveform monitor.
   If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

2-8-11. Component Video Output (Betacam) Adjustment (for DNW-A75P only in 525/60 System)

For the component video output (Betacam) adjustment to DNW-A75P under 525/60 system, perform Section 2-8-5.

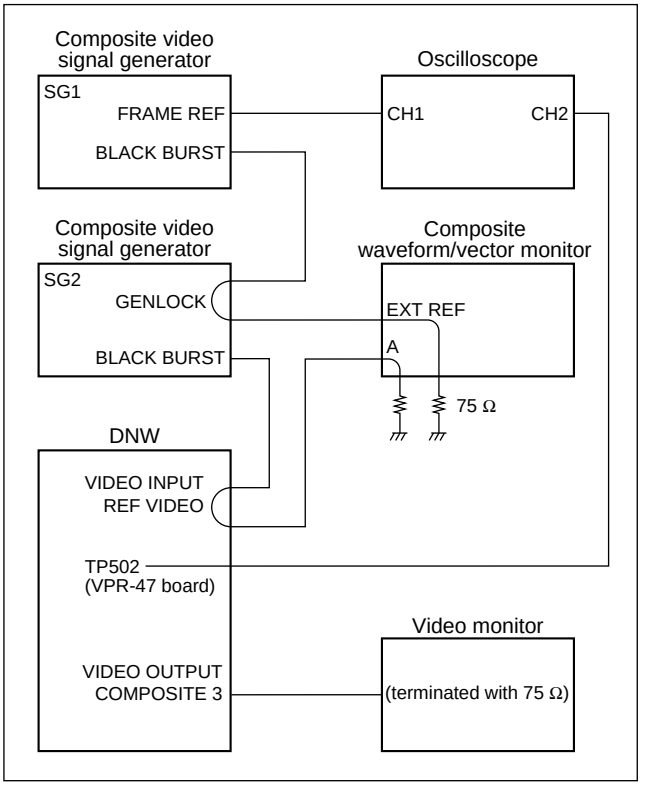
2-8-12. Reference Color Frame Pulse Check (Another System)

Note

For the reference color frame pulse check in standard system, refer to Section 2-8-6.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A75:
  TEKTRONIX TSG-271 or equivalent
  For DNW-A75P:
  TEKTRONIX TSG-170A or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A75:
  TEKTRONIX 1411 or equivalent
  For DNW-A75P:
  TEKTRONIX 1410 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A75:
  TEKTRONIX 1751, 1781R, or equivalent
  For DNW-A75P:
  TEKTRONIX 1750, 1780R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

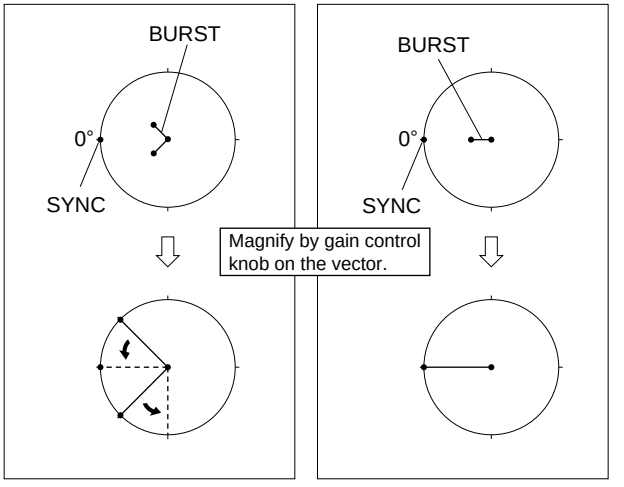
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

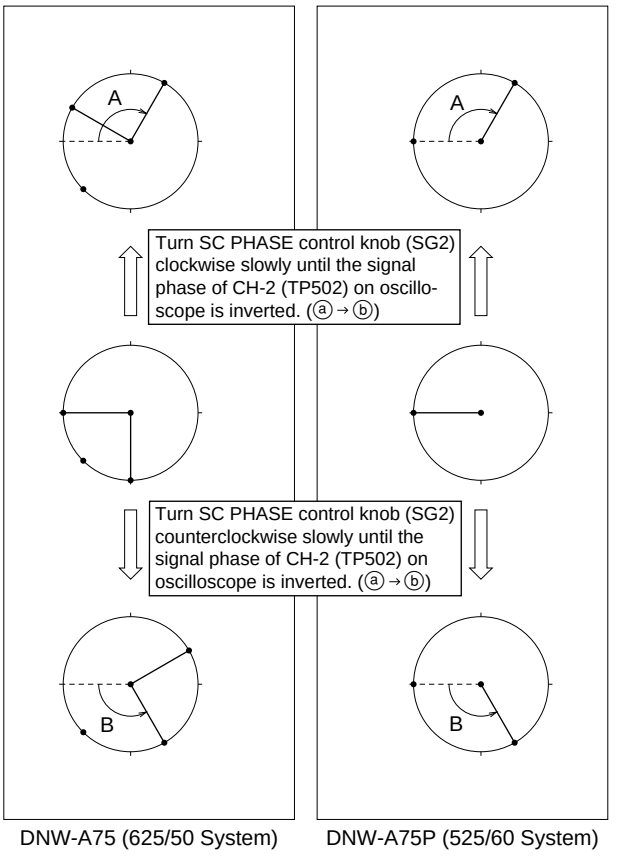
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-A75 only: Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

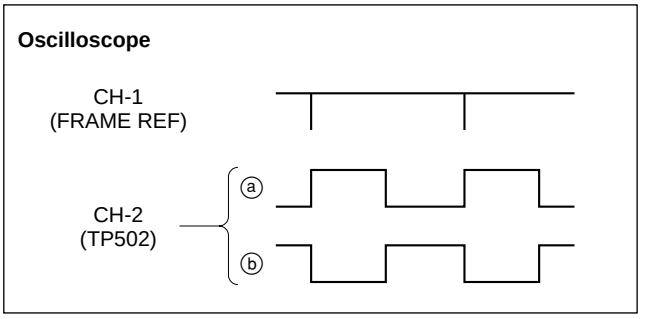


DNW-A75 (625/50 System) DNW-A75P (525/60 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20: VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 20 ms/DIV for DNW-A75
   10 ms/DIV for DNW-A75P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: A − B = 0 ±10°
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-A75 (625/50 System)
DNW-A75P (525/60 System)



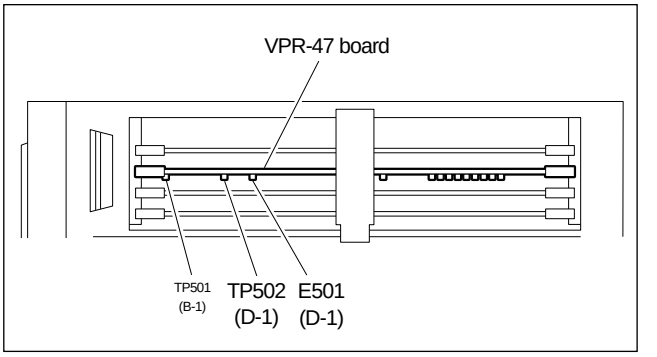
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



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Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2-8-13. Internal 4fsc Frequency Adjustment (Another System)

Note

For the internal 4fsc frequency adjustment in standard system, refer to Section 2-8-7.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR of the maintenance mode.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification: 17,734,476 ±50 Hz for DNW-A75
   14,318,181 ±50 Hz for DNW-A75P
5. To exit A20 : VPR VR, press the MENU button once.

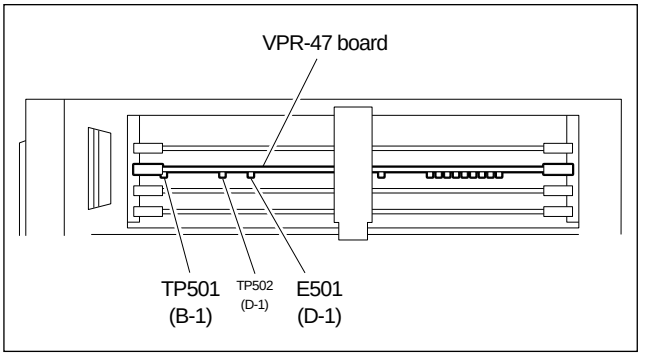
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



2-8-14. Perfection in Video System Alignment

1. For the DNW-A75P only
   Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-8-8.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Return the video system to the customer setting using the setup menu ITEM-013 : 525/625 SYSTEM SELECT.
   (Refer to Section 7-2-2 of the operation manual.)
3. Return the switch settings to the customer setting.
   (Refer to step 3 in Section 2-8-2.)

2-9. Video Input Line Alignment (DEC-110 Board)

2-9-1. Adjustment Overview

Section 2-9 explains the alignment of the following video input lines.
- Analog composite video input
- Analog component video input

For the adjustments, perform the adjustments using the menu of the maintenance mode.
When the DEC-110 board was replaced or repaired, perform the video system alignment.

Notes

- In the DNW-A75, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-A75P, be sure to adjust in 625/50 system before 525/60 system.
- In the video input line alignment, be sure to adjust without the extension board.
- For the video system of the analog Betacam PB, refer to Section 2-11.
- For the video system except video input lines, refer to Section 2-8.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

In Section 2-9, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-A75	DNW-A75P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video input line alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generators
  - For 525/60 system: TEKTRONIX TSG-170A or equivalent
  - For 625/50 system: TEKTRONIX TSG-271 or equivalent
- Analog composite waveform/vector monitors
  - For 525/60 system: TEKTRONIX 1750, 1780R, or equivalent
  - For 625/50 system: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Serial component waveform monitor: TEKTRONIX WFM601 or equivalent

  Note

  When this waveform monitor is not available, use the above analog component waveform monitor instead.
- Analog composite video monitor (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)

Adjustment Items

Section	Item	Adjustment point	Remarks
2-9-2	Preparation in standard system		DNW-A75: 525/60 system DNW-A75P: 625/50 system
2-9-3	Composite video output line check		VIDEO OUTPUT COMPOSITE 1
2-9-4	Composite video input line adjustment		
	Pedestal level	A25 : DEC VR : PEDESTAL	VIDEO OUTPUT COMPOSITE 2
	Gain (MANUAL)	A25 : DEC VR : VIDEO GAIN	
	Gain (AGC)	A25 : DEC VR : AGC VIDEO GAIN	
	Color frame detect	A24 : INPUT CF DETECT	(Automatic adjustment)
	Data save	A2F : NV-RAM CONTROL	
2-9-5	Component video output line check		VIDEO OUTPUT COMPONENT
2-9-6	Component video input line adjustment		
	Input level	A22 : AD VR(LOOP): Y INPUT LEVEL A22 : AD VR(LOOP): R-Y INPUT LEVEL A22 : AD VR(LOOP): B-Y INPUT LEVEL	SDI OUTPUT 1 or VIDEO OUTPUT COMPONENT
	Input phase	A22 : AD VR(LOOP): Y INPUT PHASE A22 : AD VR(LOOP): Y/B-Y INPUT DELAY A22 : AD VR(LOOP): Y/R-Y INPUT DELAY	
	Betacam Input level	A22 : AD VR(LOOP): B-CAM Y IN LEVEL A22 : AD VR(LOOP): B-CAM R-Y IN LEVEL A22 : AD VR(LOOP): B-CAM B-Y IN LEVEL	
	Data save	A2F : NV-RAM CONTROL	
2-9-7	Preparation in another system		DNW-A75: 625/50 system DNW-A75P: 525/60 system
2-9-8	Composite video output line check		VIDEO OUTPUT COMPOSITE 1
2-9-9	Composite video input line adjustment		
	Pedestal level	A25 : DEC VR : PEDESTAL	VIDEO OUTPUT COMPOSITE 2
	Gain (MANUAL)	A25 : DEC VR : VIDEO GAIN	
	Gain (AGC)	A25 : DEC VR : AGC VIDEO GAIN	
	Color frame detect	A24 : INPUT CF DETECT	(Automatic adjustment)
	Data save	A2F : NV-RAM CONTROL	
2-9-10	Component video output line check		VIDEO OUTPUT COMPONENT
2-9-11	Component video input line adjustment		
	Input level	A22 : AD VR(LOOP): Y INPUT LEVEL A22 : AD VR(LOOP): R-Y INPUT LEVEL A22 : AD VR(LOOP): B-Y INPUT LEVEL	SDI OUTPUT 1 or VIDEO OUTPUT COMPONENT
	Input phase	A22 : AD VR(LOOP): Y INPUT PHASE A22 : AD VR(LOOP): Y/B-Y INPUT DELAY A22 : AD VR(LOOP): Y/R-Y INPUT DELAY	
	Betacam Input level	A22 : AD VR(LOOP): B-CAM Y IN LEVEL A22 : AD VR(LOOP): B-CAM R-Y IN LEVEL A22 : AD VR(LOOP): B-CAM B-Y IN LEVEL	
	Data save	A2F : NV-RAM CONTROL	
2-9-12	Perfection in video input line adjustment		

2-9-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item		Customer setting		Setting at adjustment
SS-83 board	DIP switch S1100-1 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.			⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch			⇨	ON
	PROCESS CONTROL switch			⇨	LOCAL
	• VIDEO switch			⇨	PRESET
	• CHROMA switch			⇨	PRESET
	• SET UP or BLACK LEVEL switch			⇨	PRESET
	• Y/C DELAY switch			⇨	PRESET
	• CHROMA PHASE switch			⇨	PRESET
Connector panel	75 Ω switch	REF. VIDEO		⇨	ON (Set to the up position)
		COMPOSITE		⇨	ON (Set to the up position)

2. Set the following mode of the analog composite monitor.
   DNW-A75: NTSC
   DNW-A75P: PAL
3. Check that the video system is setting as follows:
   DNW-A75: 525/60 system
   DNW-A75P: 625/50 system
   If differed, change the video system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-A75 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	0. INPUT CAV LEVEL		⇨	B-CAM
	1. OUTPUT CAV LEVEL		⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL		⇨	0.0%
	1. INPUT LEVEL		⇨	MSTER
	2. VBLK REMOVE CNT		⇨	REMOV
	3. BETACAM PB LEVEL		⇨	MSTER
	4. OUTPUT LEVEL		⇨	MSTER

5. When extending the DEC-110 board with an extension board, stop the extending.
   Note
   If stopping the extension to the DEC-110 board, off the power, then remove the DEC-110 board.
6. Perform the other settings.
   Upper control panel
   VIDEO INPUT SELECT: COMPOSITE
   Lower control panel
   PB. EE button: Light on

2-9-3. Composite Video Output Line Check (Standard System)

Check the output level of VIDEO OUTPUT COMPOSITE 1 connector referring to Section 2-8-3.

2-9-4. Composite Video Input Line Adjustment (Standard System)

Note

For the composite video input line adjustment in the another system, refer to Section 2-9-9.

Preparing tools

- Analog composite video signal generator
  For DNW-A75:
  TEKTRONIX TSG-190A, or equivalent
  For DNW-A75P:
  TEKTRONIX TSG-271A, or equivalent
- Analog composite waveform monitor
  For DNW-A75:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A75P:
  TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

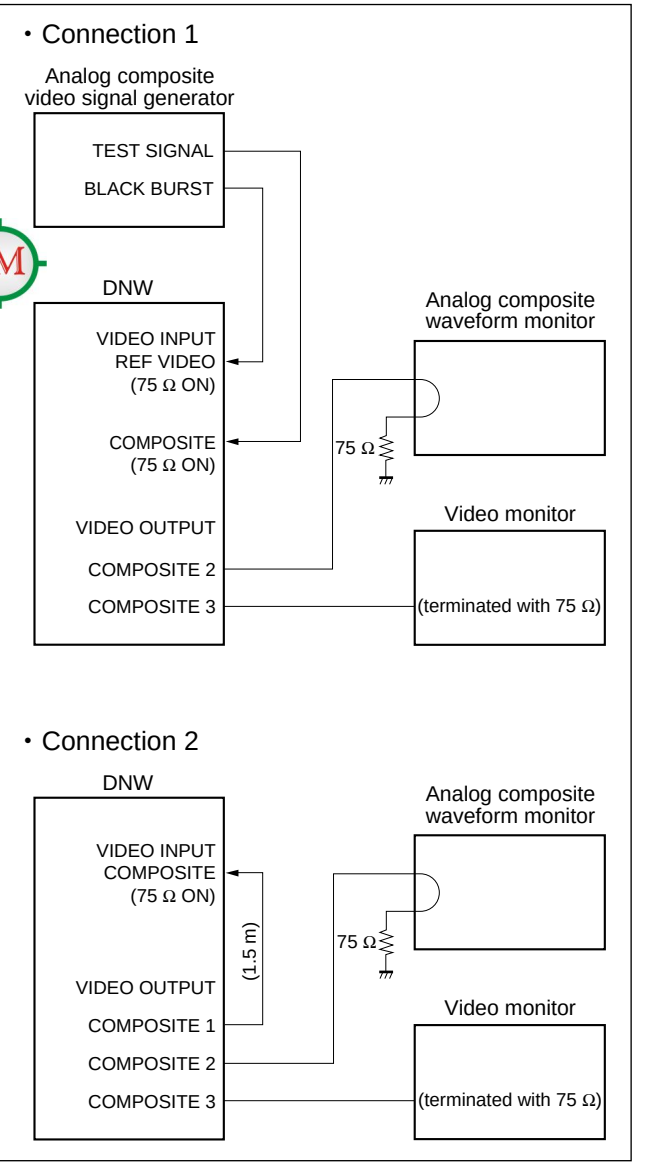
1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment as shown Connection 1 on Figure “Connections”.



Connections

4. Check the setup extend menu setting. (For the DNW-A75 only)

ITEM-713 : VIDEO SETUP REFERENCE LEVEL

0. MASTER LEVEL	⇨ 0.0%
1. INPUT LEVEL	⇨ MSTER
2. V BLK REMOTE CNT	⇨ REMOV
3. BETACAM PB LEVEL	⇨ MSTER
4. OUTPUT LEVEL	⇨ MSTER

5. Check the other settings.

Upper control panel

VIDEO INPUT SELECT: COMPOSITE

Lower control panel

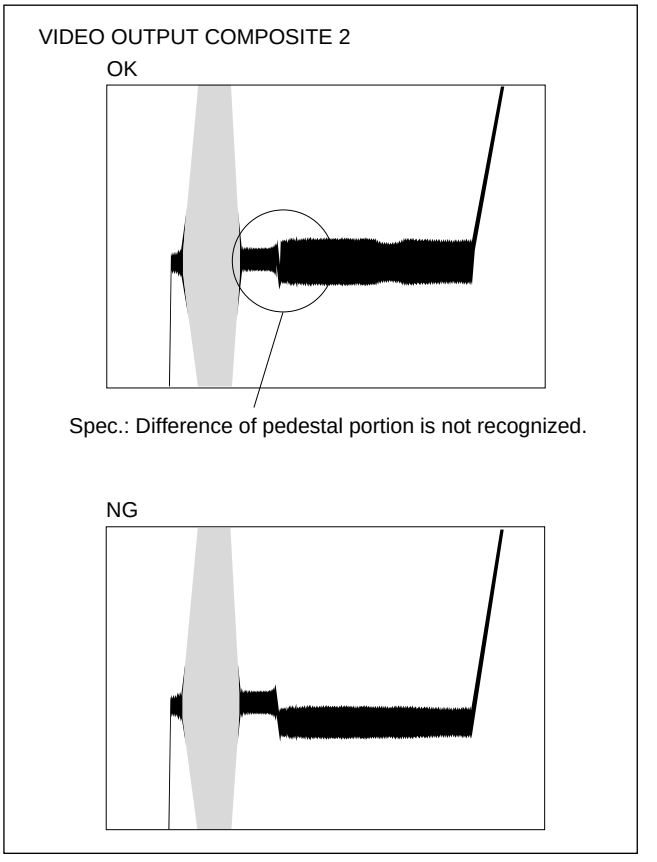
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

1. Pedestal level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A25: DEC VR.
4. Input the lamp signal from the signal generator.
5. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
6. Adjust the pedestal level.
   Adj. point: A25: DECVR: PEDESTAL
   Specification: See the figure below.



7. To exit A2: AUDIO/VIDEO ADJUST, press the MENU buton two times.

2. Gain Adjustment (MANUAL/AGC)

1. Connect as connection 2 on page 2-60.
2. Enter C2: AUDIO/VIDEO CHECK.
3. In C22: MULTI LOOP (10 TIMES) of the maintenance mode, select “100 % Color Bars” as test signal.
4. To exit C2: AUDIO/VIDEO CHECK.
5. Enter A2: AUDIO/VIDEO ADJUST.
6. Enter A25: DEC VR.

MANUAL

7. Select “VIDEO GAIN”.
8. Adjust so that the specification is satisfied.
   Adj. point: A25: DEC VR: VIDEO GAIN
   Specification: See the figure 1.

AGC

9. Select “AGC VIDEO GAIN”.
10. Adjust so that the specification is satisfied.
    Adj. point: A25: DEC VR: AGC VIDEO GAIN
    Specification: See the figure 1.
11. To exit A25: DEC VR, press the MENU button once.

3. Pedestal Level Check

1. Return the connection as connection 1 on page 2-60.
2. Input the lamp signal from the signal generator.
3. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   • Setting of waveform monitor
   SWEEP: 1 H, MAG
   GAIN: ×5
   UNCAL: MAX
4. Check that the pedestal portion satisfies the specification.
   If not, perform “1. Pedestal Level Adjustment” again.
   Specification: See the figure 2.

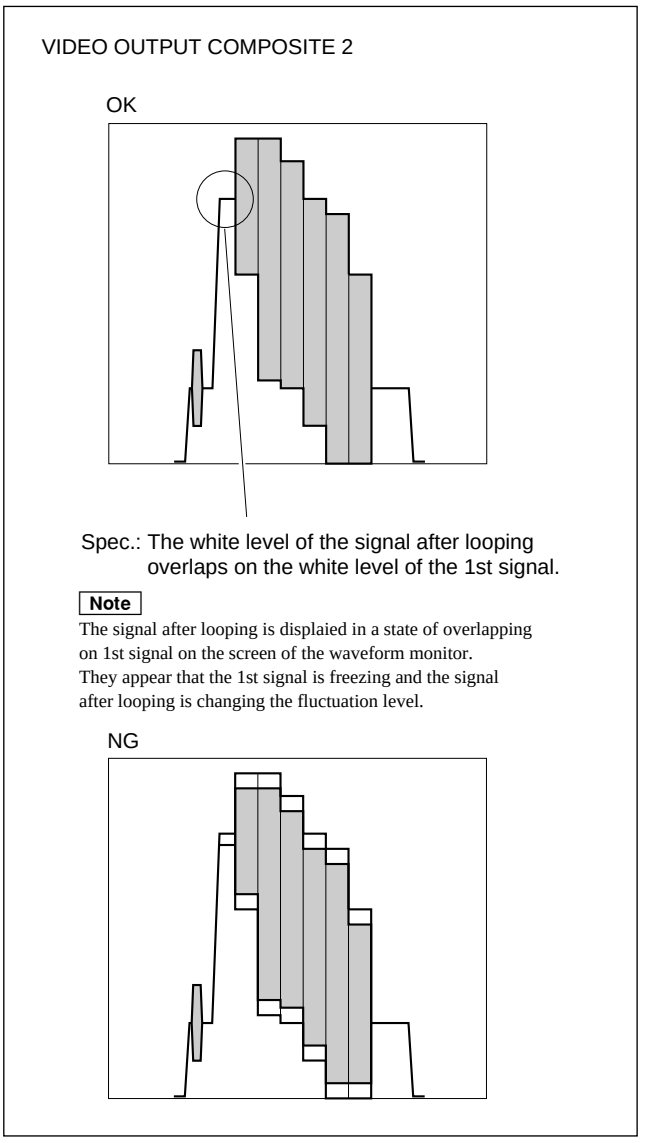

VIDEO OUTPUT COMPOSITE 2
OK
Spec.: The white level of the signal after looping overlaps on the white level of the 1st signal.
Note
The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor.
They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.
NG

Figure 1. Gain Adjustment

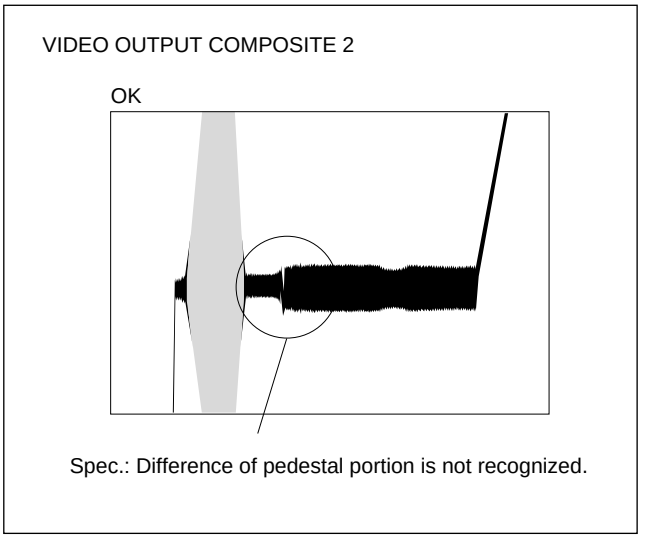


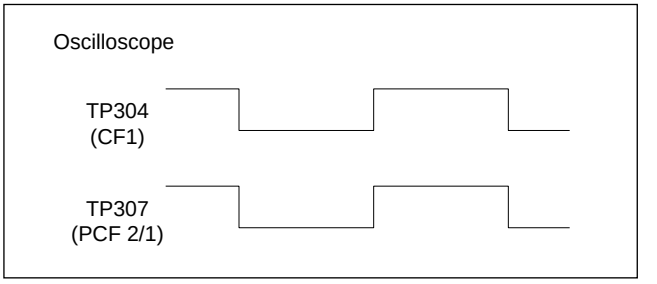
Figure 2. Pedestal Level Check

4. Color Frame Detection Adjustment

Note

Check that the video output SCH from the signal generator is within 0 ±5°.

1. Input the lamp signal from the signal generator.
2. Enter A24 : INPUT CF DETECT.
   Note
   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor.
   (In the time data display area of the VTR, "MANUAL" is displayed.)
3. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)
   Note
   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button.
   (In the time data display area, "PUSH SET" is displayed.)
4. To execute the automatic adjustment, press the SET button once on the lower control panel.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
5. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.
6. Connect and set the oscilloscope as follows:
   CH-1: TP304/VPR-47(L-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   CH-2: TP307/VPR-47(M-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   TIME: 10 ms/DIV
7. Check that two waveforms (TP304 and TP307) are the same phase.



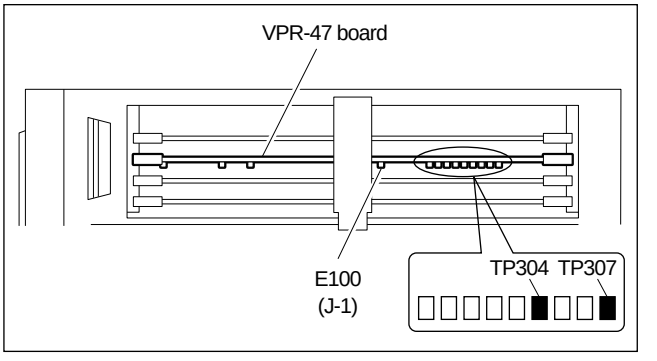
8. To exit the menu of A24 : INPUT CF DETECT, press the MENU button once.

5. Data Save (Store the adjusted data)

1. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

2. To exit the maintenance mode, press the MENU button four times.



2-9-5. Component Video Output Line Check (Standard System)

Check the output levels and output phase of VIDEO OUTPUT COMPONENT output referring to Sections 2-8-4 and 2-8-5.

2-9-6. Component Video Input Line Adjustment (Standard System)

Note

For the component video input line adjustment in the another system, refer to Section 2-9-11.

Preparing tools

- Component waveform monitor:
  TEKTRONIX WFM300, WFM601, or equivalent
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment referring to Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A75 only)

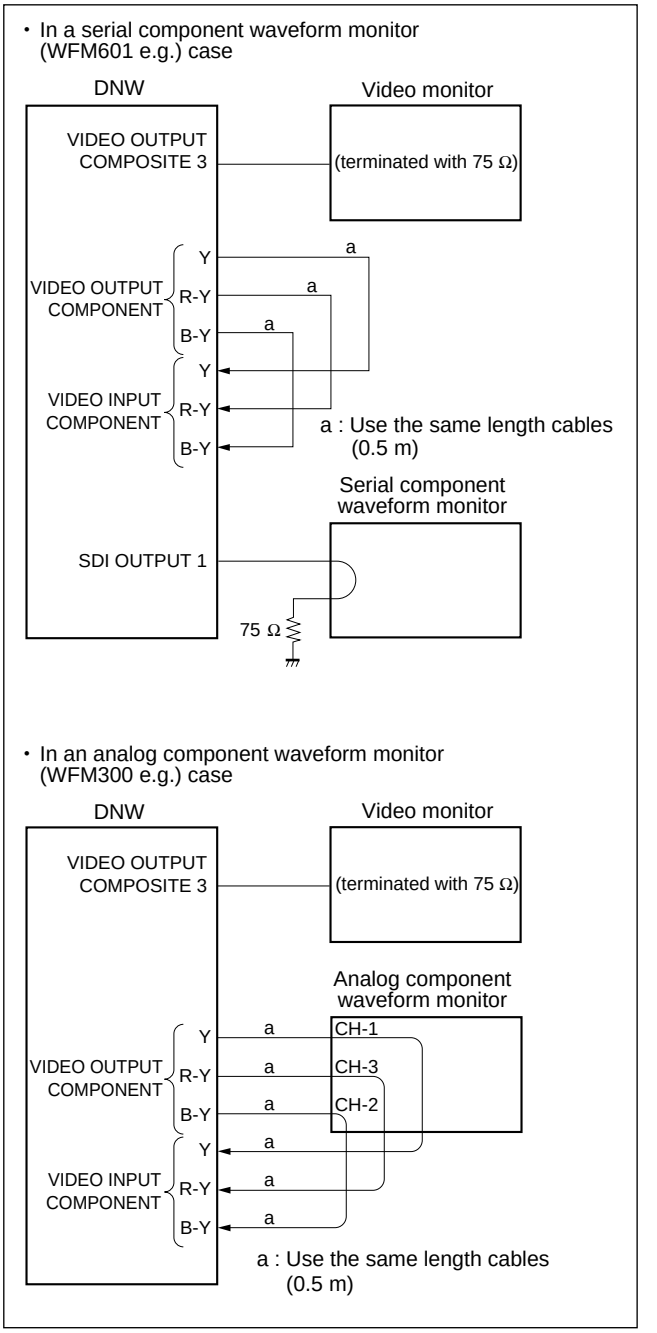
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
1. INPUT LEVEL ⇨ MSTER
2. V BLK REMOTE CNT ⇨ REMOV
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

5. Check the other settings.

Upper control panel
VIDEO INPUT SELECT: COMPOSITE
Lower control panel
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.



Connections

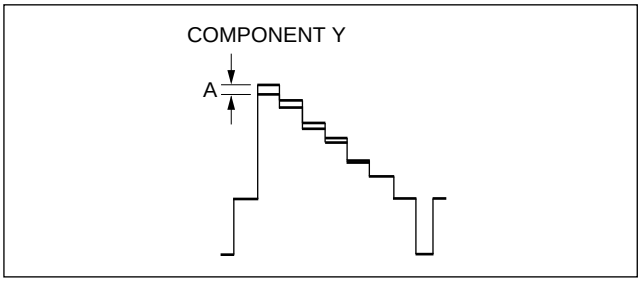
http://getMANUAL.com

1. Input Level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A22: AD VR (LOOP).

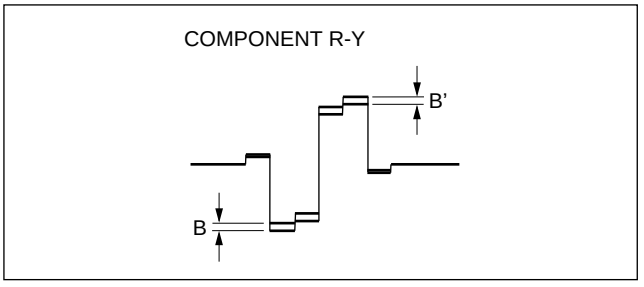
Y adjustment

4. Select “Y INPUT LEVEL”.
5. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : Y INPUT LEVEL
   Specification: A is minimize.



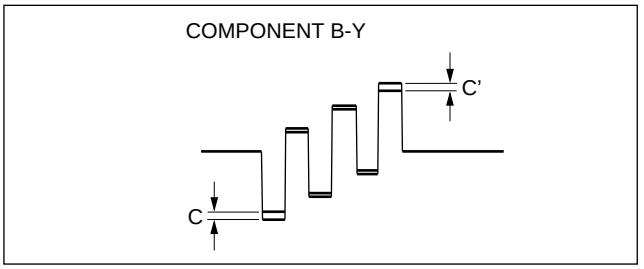
R-Y adjustment

6. Select “R-Y INPUT LEVEL”.
7. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : R-Y INPUT LEVEL
   Specification: B = B’



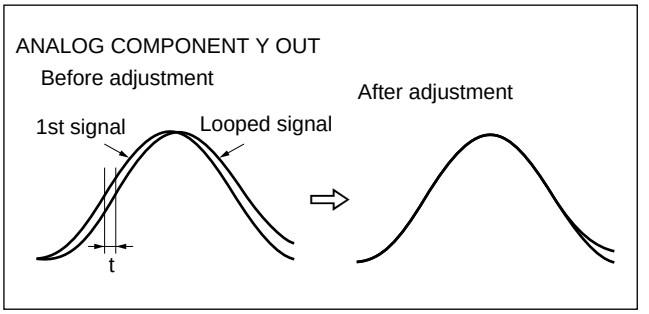
B-Y adjustment

8. Select “B-Y INPUT LEVEL”.
9. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-Y INPUT LEVEL
   Specification: C = C’

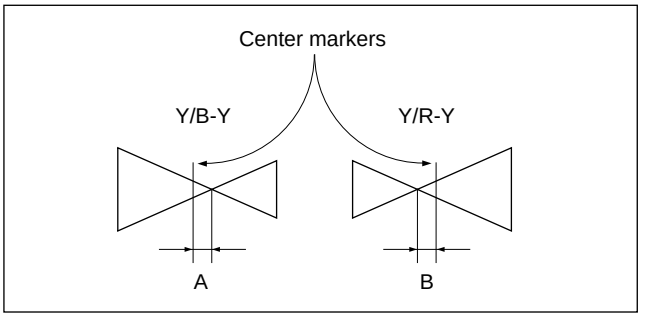


2. Input Phase Adjustment

1. Select “Y INPUT PHASE”.
2. Watch the Y signal with the component waveform monitor.
3. Display 2T pulse portion by magnifying the horizontal axis of the component waveform monitor.
4. Adjust so that 1st signal and looped signal overlap.
   Adj. point: A22: AD VR (LOOP) : Y INPUT PHASE
   Specification: t ≦ 20 ns



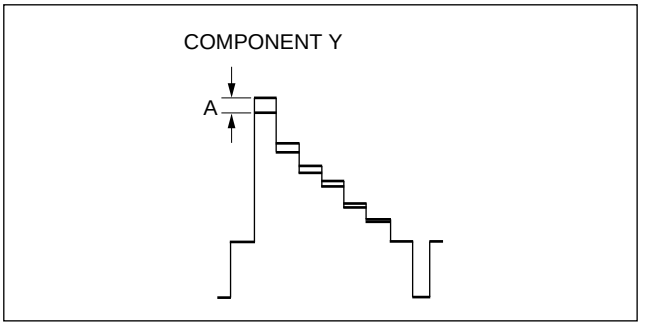
5. Set the component waveform monitor to BOWTIE mode.
6. Select “Y/B-YINPUT DELAY”
7. Adjust the cross point of Y/B-Y.
   Adj. point: A22: AD VR (LOOP) : Y/B-Y INPUT DELAY
   Specification: A = 0 ±10 ns
   (Center marker is reference.)
8. Adjust the cross point of Y/R-Y.
   Adj. point: A22: AD VR (LOOP) : Y/R-Y INPUT DELAY
   Specification: B = 0 ±10 ns
   (Center marker is reference.)



3. Betacam Input Level Adjustment

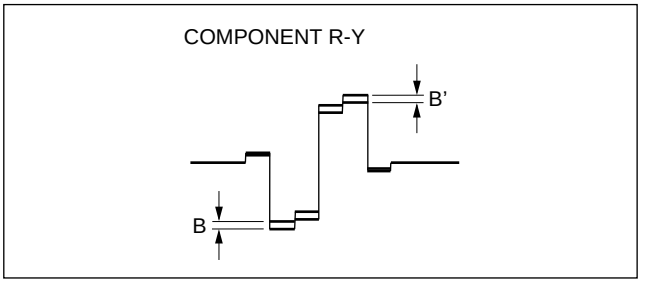
Y adjustment

1. Select “B-CAM IN LEVEL”.
2. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : B-CAM IN LEVEL
   Specification: A is minimize.



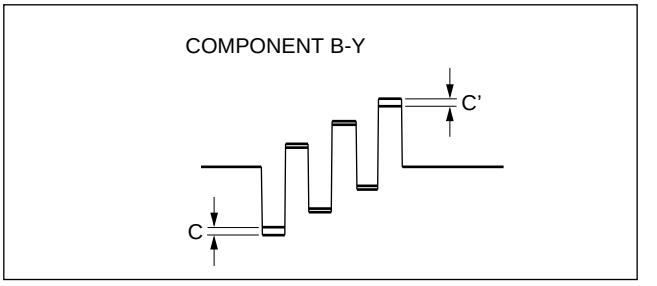
R-Y adjustment

3. Select “B-CAM R-Y IN LEVEL”.
4. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM R-Y IN LEVEL
   Specification: B = B’



B-Y adjustment

5. Select “B-CAM B-Y IN LEVEL”.
6. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM B-Y IN LEVEL
   Specification: C = C’



7. To exit A22: AD VR (LOOP) , press the MENU button once.

4. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

2. To exit the maintenance mode, press the MENU button four times.

2-9-7. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-A75

1. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-9-2.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     1. INPUT LEVEL
     2. V BLK REMOVE CNT
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
3. Set the analog composite monitor to the PAL mode.

For the DNW-A75P

1. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
2. Set the analog composite monitor to the NTSC mode.
3. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT			
1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL			
0. MASTER LEVEL	_____	⇨	0.0%
1. INPUT LEVEL	_____	⇨	MSTER
2. V BLK REMOVE CNT	_____	⇨	REMOV
3. BETACAM PB LEVEL	_____	⇨	MSTER
4. OUTPUT LEVEL	_____	⇨	MSTER

2-9-8. Composite Video Output Line Check (Another System)

Check the output level of VIDEO OUTPUT COMPOSITE 1 connector referring to Section 2-8-9.

2-9-9. Composite Video Input Line Adjustment (Another System)

Note

For the composite video input line adjustment in the standard system, refer to Section 2-9-3.

Preparing tools

- Analog composite video signal generator
  For DNW-A75:
  TEKTRONIX TSG-271A, or equivalent
  For DNW-A75P:
  TEKTRONIX TSG-190A, or equivalent
- Analog composite waveform monitor
  For DNW-A75:
  TEKTRONIX 1751, 1781R, or equivalent
  For DNW-A75P:
  TEKTRONIX 1750, 1780R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

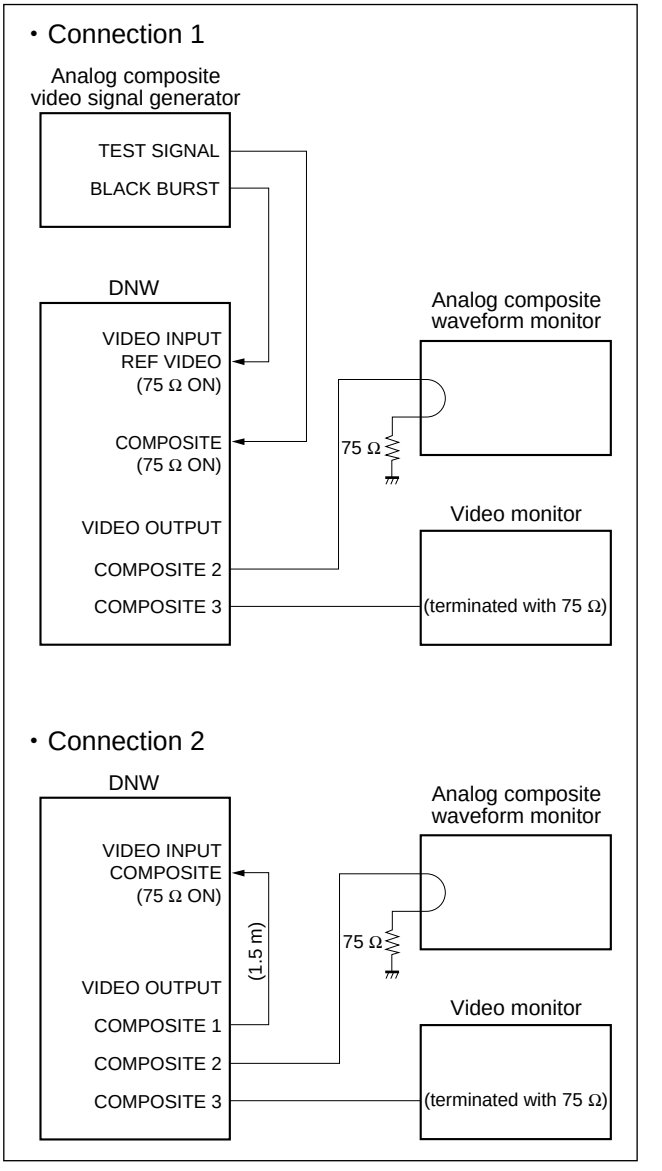
1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment as shown Connection 1 on Figure “Connections”.



Connections

4. Check the setup extend menu setting. (For the DNW-A75P only)

ITEM-713 : VIDEO SETUP REFERENCE LEVEL

0. MASTER LEVEL	⇨ 0.0%
1. INPUT LEVEL	⇨ MSTER
2. V BLK REMOTE CNT	⇨ REMOV
3. BETACAM PB LEVEL	⇨ MSTER
4. OUTPUT LEVEL	⇨ MSTER

5. Check the other settings.

Upper control panel

VIDEO INPUT SELECT: COMPOSITE

Lower control panel

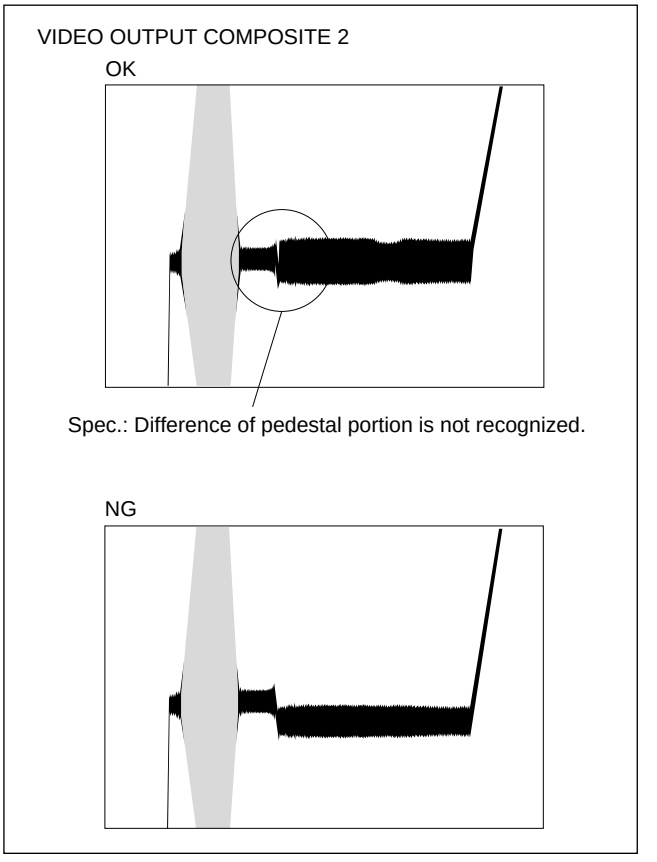
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

1. Pedestal level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A25: DEC VR.
4. Input the lamp signal from the signal generator.
5. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
6. Adjust the pedestal level.
   Adj. point: A25: DECVR: PEDESTAL
   Specification: See the figure below.



7. To exit A2: AUDIO/VIDEO ADJUST, press the MENU buton two times.

2. Gain Adjustment (MANUAL/AGC)

1. Connect as connection 2 on page 2-70.
2. Enter C2: AUDIO/VIDEO CHECK.
3. In C22: MULTI LOOP (10 TIMES) of the maintenance mode, select “100 % Color Bars” as test signal.
4. To exit C2: AUDIO/VIDEO CHECK.
5. Enter A2: AUDIO/VIDEO ADJUST.
6. Enter A25: DEC VR.

MANUAL

7. Select “VIDEO GAIN”.
8. Adjust so that the specification is satisfied.
   Adj. point: A25: DEC VR: VIDEO GAIN
   Specification: See the figure 1.

AGC

9. Select “AGC VIDEO GAIN”.
10. Adjust so that the specification is satisfied.
    Adj. point: A25: DEC VR: AGC VIDEO GAIN
    Specification: See the figure 1.
11. To exit A25: DEC VR, press the MENU button once.

3. Pedestal Level Check

1. Return the connection as connection 1 on page 2-70.
2. Input the lamp signal from the signal generator.
3. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
4. Check that the pedestal portion satisfies the specification.
   If not, perform “1. Pedestal Level Adjustment” again.
   Specification: See the figure 2.

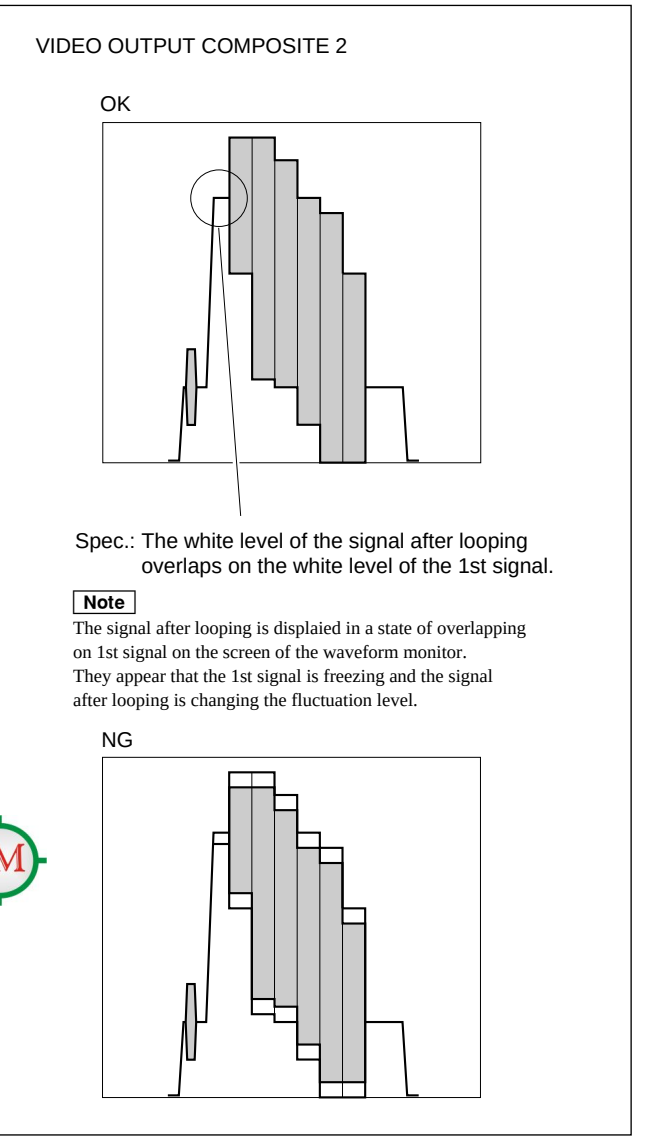

VIDEO OUTPUT COMPOSITE 2
OK
Spec.: The white level of the signal after looping overlaps on the white level of the 1st signal.
Note
The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor.
They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.
NG

Figure 1. Gain Adjustment

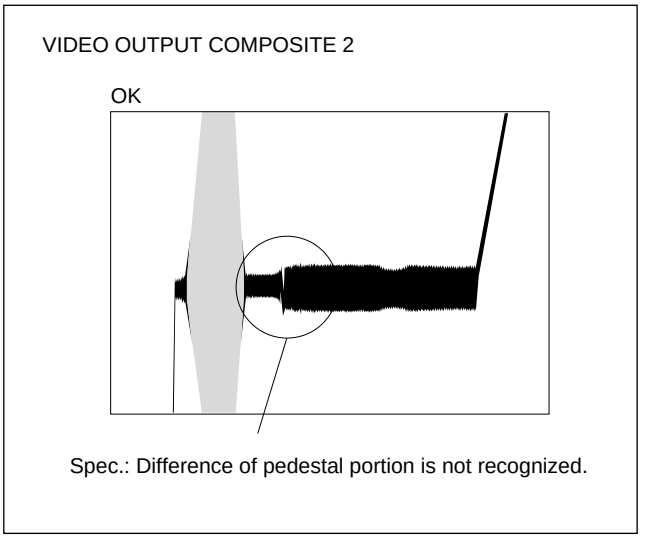


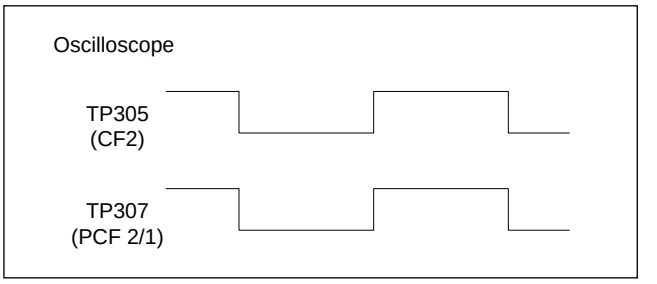
Figure 2. Pedestal Level Check

4. Color Frame Detection Adjustment

Note

Check that the video output SCH from the signal generator is within 0 ±5°.

1. Input the lamp signal from the signal generator.
2. Enter A24 : INPUT CF DETECT.
   Note
   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor.
   (In the time data display area of the VTR, "MANUAL" is displayed.)
3. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)
   Note
   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button.
   (In the time data display area, "PUSH SET" is displayed.)
4. To execute the automatic adjustment, press the SET button once on the lower control panel.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
5. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.
6. Connect and set the oscilloscope as follows:
   CH-1: TP305/VPR-47(L-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   CH-2: TP307/VPR-47(M-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   TIME: 20 ms/DIV
7. Check that two waveforms (TP304 and TP307) are the same phase.



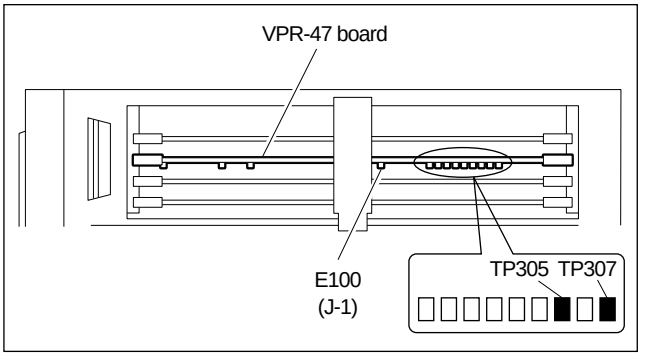
8. To exit the menu of A24 : INPUT CF DETECT, press the MENU button once.

5. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

2. To exit the maintenance mode, press the MENU button four times.



2-9-10. Component Video Output Line Check (Another System)

Check the output levels of VIDEO OUTPUT COMPONENT output referring to Section 2-8-10.

2-9-11. Component Video Input Line Adjustment (Another System)

Note

For the component video input line adjustment in the standard system, refer to Section 2-9-6.

Preparing tools

- Component waveform monitor:
  TEKTRONIX WFM300, WFM601, or equivalent
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment referring to Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A75P only)

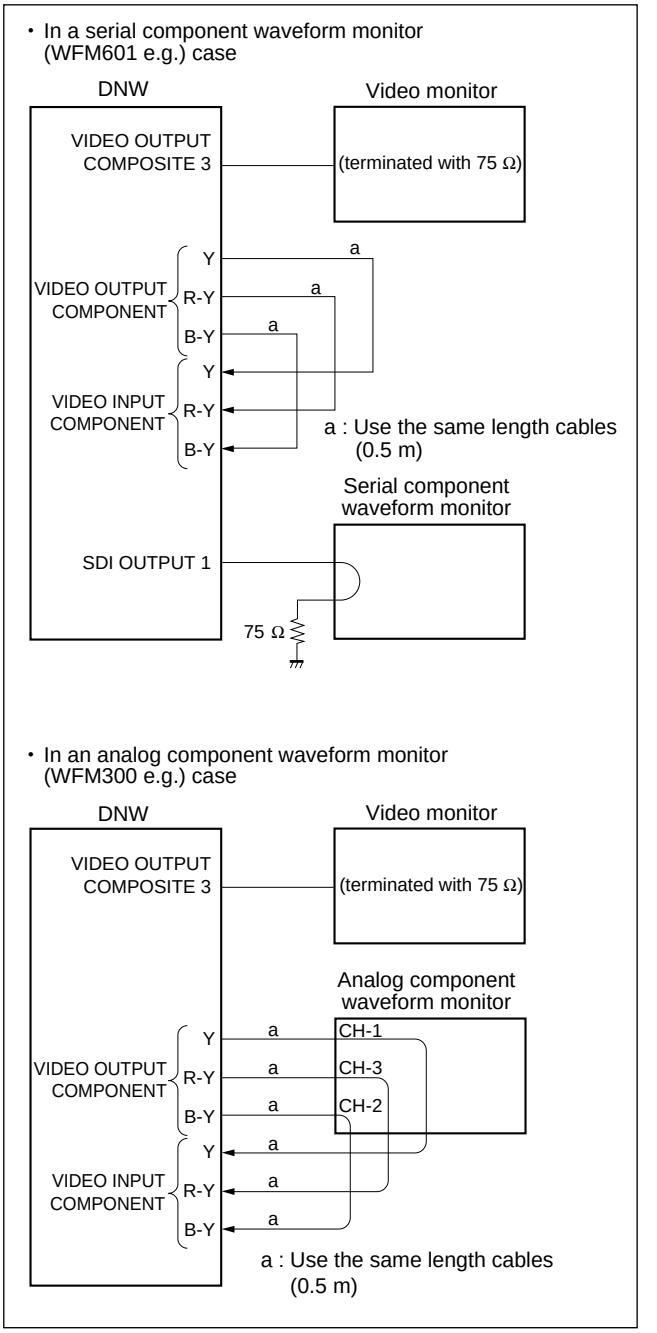
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
1. INPUT LEVEL ⇨ MSTER
2. V BLK REMOTE CNT ⇨ REMOV
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

5. Check the other settings.

Upper control panel
VIDEO INPUT SELECT: COMPOSITE
Lower control panel
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.



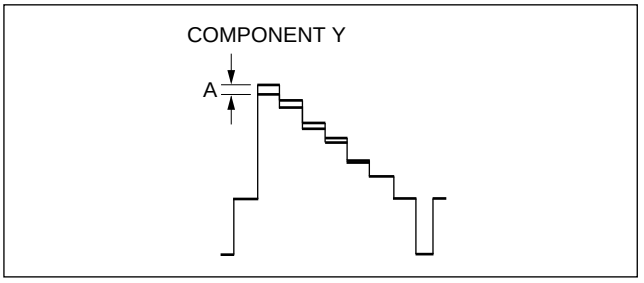
Connections

1. Input Level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A22: AD VR (LOOP).

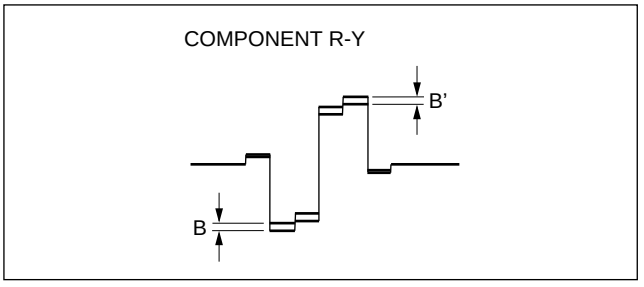
Y adjustment

4. Select “Y INPUT LEVEL”.
5. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : Y INPUT LEVEL
   Specification: A is minimize.



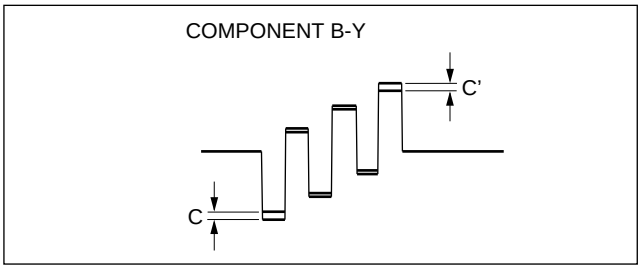
R-Y adjustment

6. Select “R-Y INPUT LEVEL”.
7. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : R-Y INPUT LEVEL
   Specification: B = B’



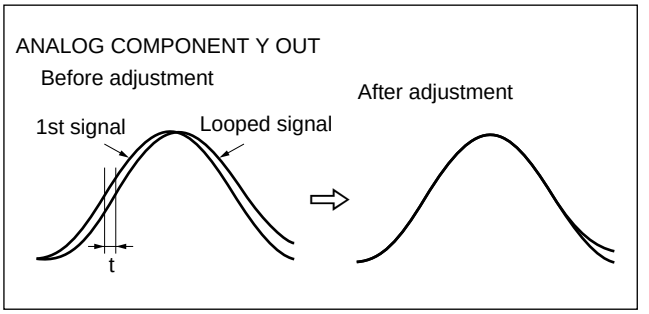
B-Y adjustment

8. Select “B-Y INPUT LEVEL”.
9. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-Y INPUT LEVEL
   Specification: C = C’

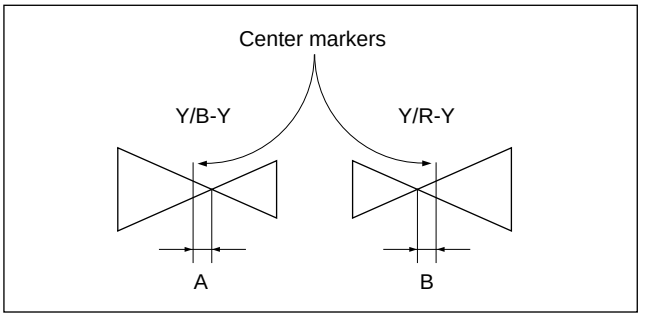


2. Input Phase Adjustment

1. Select “Y INPUT PHASE”.
2. Watch the Y signal with the component waveform monitor.
3. Display 2T pulse portion by magnifying the horizontal axis of the component waveform monitor.
4. Adjust so that 1st signal and looped signal overlap.
   Adj. point: A22: AD VR (LOOP) : Y INPUT PHASE
   Specification: t ≦ 20 ns



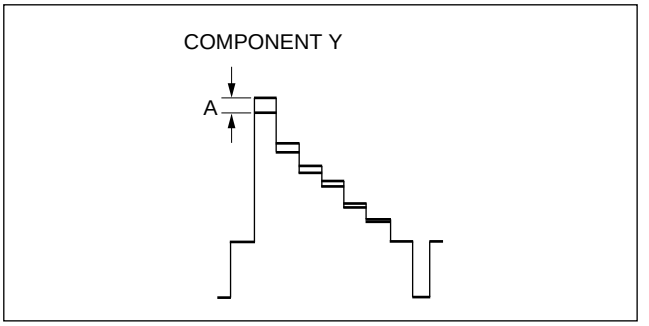
5. Set the component waveform monitor to BOWTIE mode.
6. Select “Y/B-YINPUT DELAY”
7. Adjust the cross point of Y/B-Y.
   Adj. point: A22: AD VR (LOOP) : Y/B-Y INPUT DELAY
   Specification: A = 0 ±10 ns
   (Center marker is reference.)
8. Adjust the cross point of Y/R-Y.
   Adj. point: A22: AD VR (LOOP) : Y/R-Y INPUT DELAY
   Specification: B = 0 ±10 ns
   (Center marker is reference.)



3. Betacam Input Level Adjustment

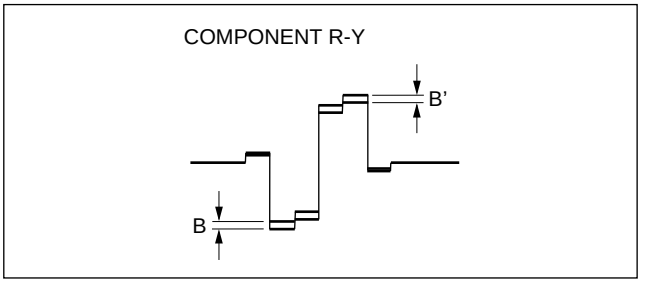
Y adjustment

1. Select “B-CAM IN LEVEL”.
2. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : B-CAM IN LEVEL
   Specification: A is minimize.



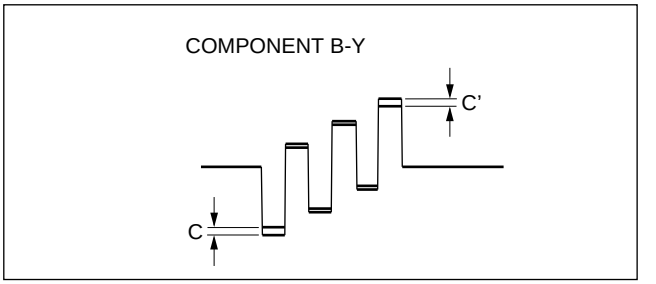
R-Y adjustment

3. Select “B-CAM R-Y IN LEVEL”.
4. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM R-Y IN LEVEL
   Specification: B = B’



B-Y adjustment

5. Select “B-CAM B-Y IN LEVEL”.
6. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM B-Y IN LEVEL
   Specification: C = C’



7. To exit A22: AD VR (LOOP) , press the MENU button once.

4. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

2. To exit the maintenance mode, press the MENU button four times.

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2-9-12. Perfection in Video System Alignment

1. For the DNW-A75P only
   Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-9-7.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Return the video system to the customer setting using the setup menu ITEM-013 : 525/625 SYSTEM SELECT.
   (Refer to Section 7-2-2 of the operation manual.)
3. Return the switch settings to the customer setting.
   (Refer to step 3 in Section 2-9-2.)

2-10. Analog Betacam PB System Alignment

2-10-1. Adjustment Overview

Perform this section when aligning the video system in the analog Betacam PB system.
When aligning the audio system (LAU/AFM) in the analog Betacam PB system, refer to Section 2-7.

Note

For DNW-A75, be sure to adjust in the 525/60 system.
For DNW-A75P, be sure to adjust in the 625/50 system.
If differed, change the video system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

In this Section 2-10, perform the adjustments for the following boards. For adjustment items and its order, refer to "Adjustment Items" (next page).

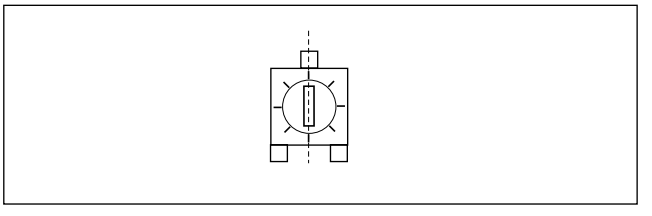
- DM-89 board
- EQ-56 board
- TBC-23A board
- TBC-24 board

However, the setting/check/adjustment for each board are as follows:

DM-89 board: Section 2-10-2 to 2-10-19
TBC-23A board: Section 2-10-2, 2-10-3, 2-10-24, 2-10-25, and 2-10-28
TBC-24 board: Section 2-10-2, 2-10-29, and later

Notes

- When the EQ-56 board was replaced/repaired, refer to Section 2-6.
- As for RV202 on the TBC-24 board of board number suffixes 16 and higher for DNW-A75P use:
  If it is replaced or it is turned by mistake, set it to the mechanical center position as figure below. (This VR is for C A/D input linearity.)



Tools List

To perform the analog Betacam PB system alignment, prepare the following equipment and fixtures.

- Analog composite video signal generator
  DNW-A75: TEKTRONIX TSG-170A or equivalent
  DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

  Note

  It is required that the component video signal generator is able to output the 50% bowtie signal.
- Analog composite waveform/vector monitor
  DNW-A75: TEKTRONIX 1750, 1780R, or equivalent
  DNW-A75P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Network analyzer:
  ANRITSU MS420B or equivalent
- Digital voltmeter:
  ADVANTEST TR6845 or equivalent
- VISC phase adjustment tool (for DNW-A75P only)
  (Part No. J-6332-240-A)
- Analog component video monitor
  (NTSC/PAL switchable type)

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Cleaning tape: BCT-5CLN
  (SONY standard products)
- Alignment tapes
  DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Adjustment Items

No.	Item		Adjustment point	Remarks
2-10-3	Initial data setting		All data of A3 : BETACAM PB ADJUST	
2-10-4	EQ RF output level adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Data save	A3F : NV-RAM CONTROL	
2-10-5	Cosine equalizer adjustment			
	OMC DC offset		A35 : DM VR 4 : OMC DC METAL-Y	Set the data to E4.
			A35 : DM VR 4 : OMC DC METAL-C A35 : DM VR 4 : OMC DC OXIDE-Y A35 : DM VR 4 : OMC DC OXIDE-C	Set the data to D0.
	METAL Y	Group delay	⊘RV101/DM-89, ⊘RV102/DM-89	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-Y-A A33 : DM VR 2 : MAIN METAL-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-Y-A A34 : DM VR 3 : SUB METAL-Y-B	DNW-A75: Set the data B0. DNW-A75P: TP2/DM-89
	METAL C	Group delay	⊘RV301/DM-89, ⊘RV302/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-C-A A33 : DM VR 2 : MAIN METAL-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-C-A A34 : DM VR 3 : SUB METAL-C-B	DNW-A75: Set the data 70. DNW-A75P: TP6/DM-89
	OXIDE C	Group delay	⊘RV303/DM-89, ⊘RV304/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-C-A A33 : DM VR 2 : MAIN OXIDE-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-C-A A34 : DM VR 3 : SUB OXIDE-C-B	TP6/DM-89
	OXIDE Y	Group delay	⊘RV104/DM-89, ⊘RV103/DM-89*1	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-Y-A A33 : DM VR 2 : MAIN OXIDE-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-Y-A A34 : DM VR 3 : SUB OXIDE-Y-B	TP2/DM-89
	Data save		A3F : NV-RAM CONTROL	
2-10-6	Cosine equalizer provisional adjustment			

Note

This provisional adjustment explains how to adjust without using the network analyzer as opposed to adjustment (Section 2-10-5) using the network analyzer.
Perform this provisional adjustment only when the network analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 2-10-5) using the network analyzer at a later date.

*1: RV103 is not equipped on the DM-89 board of LOT Nos. 407 and higher.

(Continued)

No.	Item		Adjustment point	Remarks
2-10-7	DM RF output level adjustment			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
2-10-8	OMC carrier balance adjustment			
		METAL Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
		METAL C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
		OXIDE C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
		OXIDE Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
2-10-9	OMC carrier balance provisional adjustment **Note** This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (Section 2-10-8) using the spectrum analyzer. Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 2-10-8) using the spectrum analyzer at a later date.			
2-10-10	Demodulator limiter balance adjustment			
		Y	⊘RV502/DM-89	TP501/DM-89
		C	⊘RV702/DM-89	TP8/DM-89
2-10-11	Non-liner output level adjustment			
		METAL Y	⊘RV503/DM-89	TP505/DM-89
		METAL C	⊘RV703/DM-89 (For DNW-A75P) ⊘RV704/DM-89 (For DNW-A75)	TP705/DM-89
		OXIDE C	⊘RV704/DM-89 (For DNW-A75P)	TP705/DM-89
		OXIDE Y	⊘RV504/DM-89	TP505/DM-89
2-10-12	PB frequency response adjustment			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	
2-10-13	Drop-out compensation equalizer adjustment			
		METAL Y	⊘RV201/DM-89	TP203/DM-89
		METAL C	⊘RV401/DM-89	TP403/DM-89
		OXIDE Y	⊘RV202/DM-89	RV202/DM-89
		OXIDE C	⊘RV402/DM-89	RV402/DM-89

OMC: Over-Modulation Compensation circuit

(Continue)

(Continued)

No.	Item		Adjustment point	Remarks
2-10-14	DM RF output level readjustment			
		OXIDE C	⊘RV212/DM-89	TP3/DM-89
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE Y	⊘RV407/DM-89	TP7/DM-89
2-10-15	RF envelope adjustment			
		TH H level	A36 : DM VR 5 : ENV-TH-H	Set the data to 20.
		TH L level	A36 : DM VR 5 : ENV-TH-L	Set the data to 10.
		Data save	A3F : NV-RAM CONTROL	
		Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
2-10-16	DM search picture adjustment			
		Offset	⊘RV506/DM-89	TP500/DM-89
		Y	⊘RV501/DM-89	TP502/DM-89
		C	⊘RV701/DM-89	TP702/DM-89
		Gain	⊘RV507/DM-89	TP1/DM-89
2-10-17	Pairing check	METAL	—	Video monitor
		OXIDE	—	Video monitor
2-10-18	Guard band width adjustment			
		METAL	A35 : DM VR 4 : GUARD BAND M-Y A35 : DM VR 4 : GUARD BAND M-C	Video monitor
		OXIDE	A35 : DM VR 4 : GUARD BAND O-Y A35 : DM VR 4 : GUARD BAND O-C	Video monitor
		Data save	A3F : NV-RAM CONTROL	
2-10-19	Component output level adjustment			
		METAL Y	⊘RV101/TBC-24	VIDEO OUTPUT COMPONENT Y
		METAL C	⊘RV201/TBC-24	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	⊘RV504/DM-89	VIDEO OUTPUT COMPONENT Y
		OXIDE C	⊘RV704/DM-89 (For DNW-A75P)	VIDEO OUTPUT COMPONENT R-Y/B-Y
2-10-20	A/D clamp DC level adjustment			
		C	⊘RV202/TBC-24※2	TP202/TBC-24
		Y	⊘RV102/TBC-24※2	TP102/TBC-24
2-10-21	VCO lock-in range adjustment			
		Y	⊘RV404/TBC-24※2 ⊘LV401/TBC-24	RV404/TBC-24 TP403/TBC-24
		C	⊘RV604/TBC-24※2 ⊘LV601/TBC-24	RV604/TBC-24 TP603/TBC-24

(Continue)

※2: These VRs are equipped on the TBC-24 board of board number suffixes 11 and 12.

(Continued)

No.	Item		Adjustment point	Remarks
2-10-22	TBC VCO free-running adjustment*3			
		Y	⊘RV303/TBC-24	RV404/TBC-24 and Video monitor
		C	⊘RV503/TBC-24	Video monitor
2-10-23	FAST VCO tracking adjustment			
		Gain	⊘RV400/TBC-24*4	RV400/TBC-24
		Offset	⊘RV402/TBC-24*5 (For DNW-A75)	Video monitor
2-10-24	PB video phase adjustment		⊘RV300/TBC-24 A37 : TBC VR : SQ Y RZ*6	VIDEO OUTPUT COMPONENT Y
2-10-25	TBC Y/C delay rough adjustment			
		METAL	⊘RV502/TBC-24 ⊘RV503/TBC-24 ⊘RV500/TBC-24 A37 : TBC VR : SQ C RZ*7 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
2-10-26	Impact error offset adjustment			
		Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	Video monitor
2-10-27	TBC Y/C delay adjustment			
		METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT
2-10-28	VISC phase adjustment		⊘RV200/TBC-23A A37 : TBC VR : VISC PHASE*9	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	

∗3: This adjustment is performed only if RV303 on the TBC-24 board was replaced or it was turned by mistake.
∗4: RV400 is equipped on the TBC-24 board of board number suffixes 11, 12, and 13.
∗5: RV402 is equipped on the TBC-24 board of board number suffixes 11, 12, and 13 for DNW-A75 use.
∗6: If the specification is not satisfied by adjusting RV300 on TBC-24 board, change the data of A37 : TBC VR : SQ Y RZ.
∗7: If the specification is not satisfied by adjusting RV500 on TBC-24 board, change the data of A37 : TBC VR : SQ C RZ.
∗8: RV504 is equipped on the TBC-24 board of board number suffixes 14 and higher.
∗9: If the specification is not satisfied by adjusting RV200 on TBC-23A board, change the data of A37 : TBC VR : VISC PHASE.

2-10-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the Betacam / Betacam SP PB system alignment.

1. Reset the all switches on the DM-89 and TBC-23A boards to the factory settings.

   Note

   Before removing the board, turn off the power.

Board	Ref. No.	Factory setting
DM-89	S101, S102, S301, S302	NOR (right side)
	S501	ON (right side)
	S901	all OFF (down side)
TBC-23A	S1, S500	all OFF (down side)

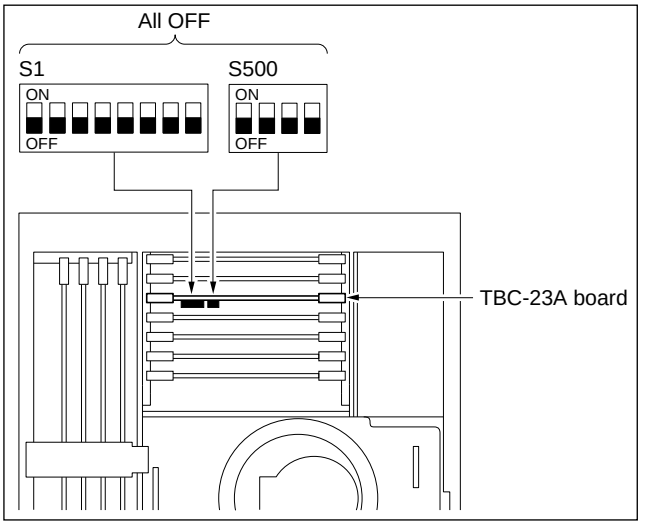
2. Set the VTR's switches as follows:

Location Item	Customer setting	Setting at adjustment
SS-83 board		
DIP switch S1100-1 (M-1)	_____	⇨ ON (up position)
Note Set to treat the extended menu of the setup menu.		
Sub control panel		
CHARACTER switch	_____	⇨ ON
OUT REF switch	_____	⇨ REF
PROCESS CONTROL switch	_____	⇨ LOCAL
• VIDEO switch	_____	⇨ PRESET
• CHROMA switch	_____	⇨ PRESET
• SET UP switch or BLACK LEVEL switch	_____	⇨ PRESET
• Y/C DELAY switch	_____	⇨ PRESET
• CHROMA PHASE switch	_____	⇨ PRESET
KEY INHIBIT switch	_____	⇨ OFF
CAPSTAN LOCK switch	_____	⇨ 2FD
Upper control panel		
TC (LTC/AUTO/VISC)	_____	⇨ LTC
TC GENERATOR:		
INT/EXT	_____	⇨ INT
PRESET/REGEN	_____	⇨ REGEN
FREE RUN/REC RUN	_____	⇨ REC RUN
REMOTE : 9P	_____	⇨ Off (Light off)
50P	_____	⇨ Off (Light off)

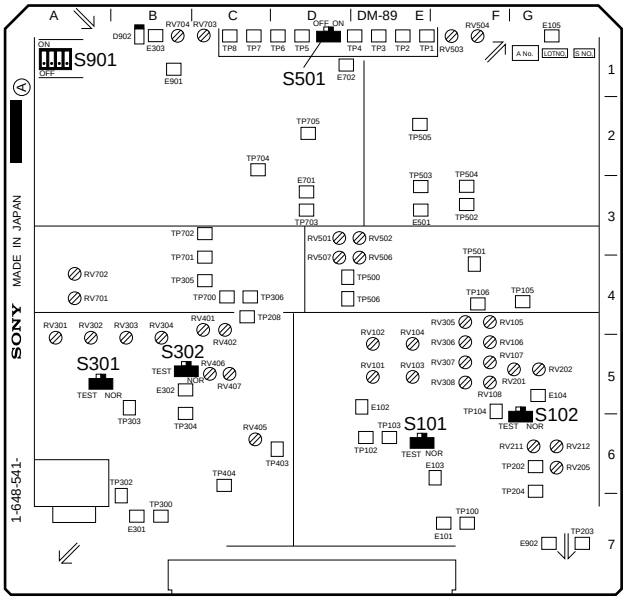
3. For the DNW-A75 only: Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting	Setting at adjustment
709 : CAV LEVEL FORMAT		
1. OUTPUT CAV LEVEL	_____	⇨ B-CAM
713 : VIDEO SETUP REFERENCE LEVEL		
0. MASTER LEVEL	_____	⇨ 0.0%
3. BETACAM PB LEVEL	_____	⇨ MSTER
4. OUTPUT LEVEL	_____	⇨ MSTER

4. Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.
   - The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.



S1 and S500 on TBC-23A Board



DM-89 Board (Side A)

2-10-3. Initial Data Settings

Input the initial data as the adjustment data of the analog Betacam PB system when the following cases only.

- When the DM-89 board was replaced.
- When the TBC-23A board was replaced.
- When the NV-RAM (IC908) on the DM-89 board was replaced.
- When the NV-RAM (IC200) on the TBC-23A board was replaced.

Preparing tool

- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1. Initial Data Settings (Standard System)

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A3 : BETACAM PB ADJUST.
3. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, set the initial data to each item of the following sub-menus (A31 to A36).
   DNW-A75 : Data on 525/60 column
   DNW-A75P : Data on 625/50 column

Item (A3 :BETACAM ADJUST)		Initial data 525/60	625/50
A32 : DM VR 1	EQ1 METAL-Y-A	77	71
	EQ1 METAL-Y-B	77	71
	EQ1 METAL-C-A	7B	79
	EQ1 METAL-C-B	7B	79
	EQ1 OXIDE-Y-A	9B	AD
	EQ1 OXIDE-Y-B	9B	AD
	EQ1 OXIDE-C-A	9F	AA
	EQ1 OXIDE-C-B	9F	AA
A33 : DM VR 2	MAIN METAL-Y-A	CC	CC
	MAIN METAL-Y-B	CC	CC
	MAIN METAL-C-A	8F	8F
	MAIN METAL-C-B	8F	8F
	MAIN OXIDE-Y-A	A5	A5
	MAIN OXIDE-Y-B	A5	A5
	MAIN OXIDE-C-A	9F	9F
	MAIN OXIDE-C-B	9F	9F
A34 : DM VR 3	SUB METAL-Y-A	B0	C4
	SUB METAL-Y-B	B0	C4
	SUB METAL-C-A	70	70
	SUB METAL-C-B	70	70
	SUB OXIDE-Y-A	B1	B1
	SUB OXIDE-Y-B	B1	B1
	SUB OXIDE-C-A	A5	A5
	SUB OXIDE-C-B	A5	A5
A35 : DM VR 4	GUARD BAND METAL-Y	1C (38*)	26 (29*)
	GUARD BAND METAL-C	1E (21*)	26 (16*)
	GUARD BAND OXIDE-Y	2F (48*)	30 (3B*)
	GUARD BAND OXIDE-C	30 (30*)	30 (16*)
	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0
A36 : DM VR 5	DO TH METAL-Y	14	1E
	DO TH METAL-C	16	1D
	DO TH OXIDE-Y	27	28
	DO TH OXIDE-C	28	28
	ENV-TH-H	20	20
	ENV-TH-L	10	10

*: When the board number suffix of the DM-89 board is 13.

4. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, set the inital data to each item of the following sub-menu (A37).
   DNW-A75 : Data on 525/60 column
   DNW-A75P : Data on 625/50 column

Item (A3 :BETACAM ADJUST)		Initial data 525/60	625/50
A37 : TBC VR	SQ Y RZ	4B	4A
	SQ C RZ	6F	6E
	VISC PHASE	05	03

5. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.
6. To exit the maintenance mode, press the MENU button four times.

2. Initial Data Setting (Another System)

7. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-7 of the operation manual.) And switch the video system of the video monitor.
8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A3 : BETACAM PB ADJUST.
10. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, set the initial data to each item of the sub-menus (A31 to A36).
    DNW-A75 : Data on 625/50 column in step 3
    DNW-A75P : Data on 525/60 column in step 3
11. When the TBC-23A board or NV-RAM (IC200/DM-89) was as replaced only, set the initial data to each item of the sub-menu (A37).
    DNW-A75 : Data on 625/50 column in step 4
    DNW-A75P : Data on 525/60 column in step 4
12. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
13. To exit the maintanance mode, press the MENU botton four times.
14. Return the video system of the unit using the setup menu ITEM-013 :525/625 SYSTEM SELECT. And return the video system of the video monitor.
    DNW-A75 : 525/60 system (NTSC)
    DNW-A75P : 625/50 system (PAL)

2-10-4. EQ RF Output Level Adjustment

Adjust the EQ RF output level referring to “2-6-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment”.

2-10-5. Cosine Equalizer Adjustment

Note

If the network analyzer is not available, perform “2-10-6. Cosine Equalizer Provisional Adjustment”.

Preparing tools

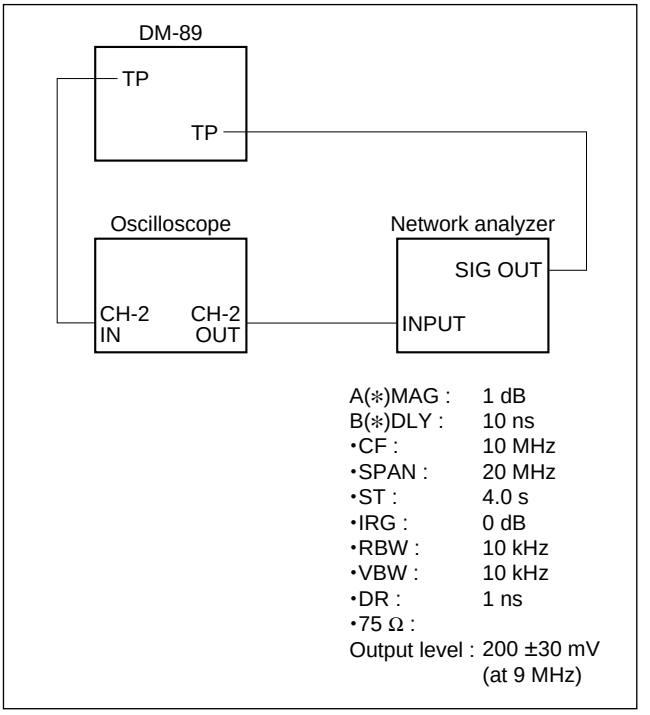
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Network analyzer: ANRITSU MS420B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)

  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Network Analyzer

Preparation of Cosine Equalizer Adjustment

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Set the following switches on the DM-89 board.

S901-1, -3 (A-1) ⇨ ON
S101(E-6), S301(A-5) ⇨ TEST (left side)

Other switches are the factory setting.
(Refer to step 1 in “2-10-2. Common Preparation”.)

3. Check the setting on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Connect the equipment.

Connect the oscilloscope and network analyzer. (Refer to Figure “Connection and Setting of Network Analyzer”.)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

http://getMANUAL.com

1. Enter the Maintenance Mode and Check the Initial Data

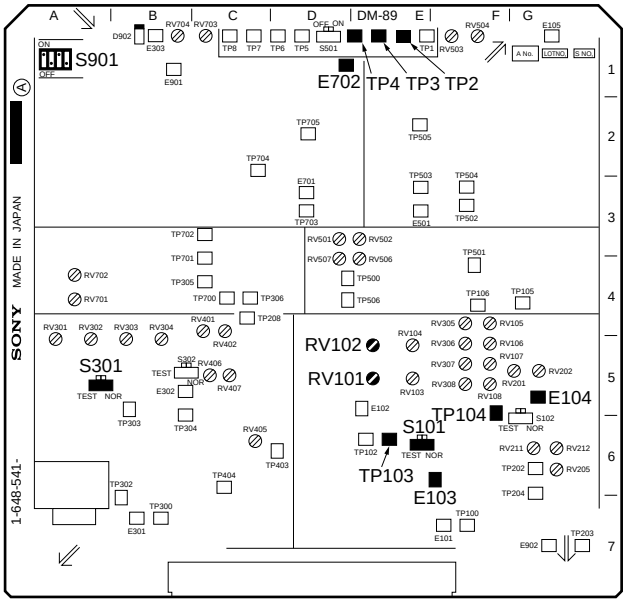
1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A35 : DM VR 4, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.) (This is OMC DC offset setting data check.)

Item (A35 : DM VR 4)	Setting data
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

3. To exit A35 : DM VR 4, press the MENU button once.

When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, perform the follow in step 4 through 7.

4. Enter A33 : DM VR 2, then check that the initial data of the all items in A33 : DM VR 2 are the specified data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the specified data.)
5. To exit A33 : DM VR 2, press the MENU button once.
6. Enter A34 : DM VR 3, then check that the initial data of the all items in A34 : DM VR 3 are the specified data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the specified data.)
7. To exit A34 : DM VR 3, press the MENU buttom once.



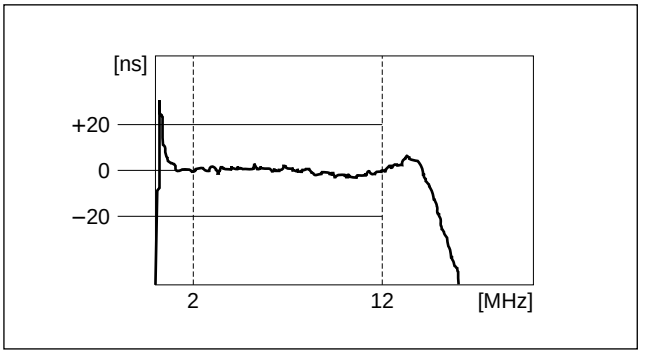
DM-89 Board (Side A)

2. METAL Y Adjustment

1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)
3. Insert the following alignment tape in order to set STANDBY OFF mode.
   DNW-A75: CR5-1B
   DNW-A75P: CR5-1B PS

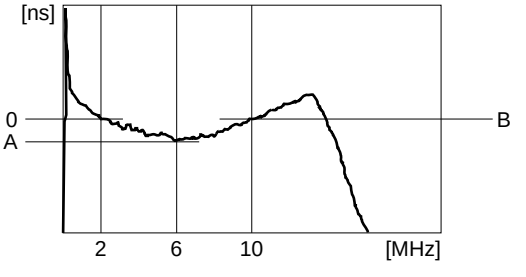
Group delay adjustment / METAL Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89 (F-5). GND: E104/DM-89(G-5)
5. Adjust the group delay time in 2 MHz through 12 MHz.
   Adj. points: ⊘RV101/DM-89(E-5) and ⊘RV102/DM-89(E-5)
   Specification: 0 ±20 ns



6. For DNW-A75 only:
   Adjust each delay times at 6 MHz and 10 MHz using 2 MHz as the reference.
   Adj. points: 6 MHz : ⊘RV101/DM-89(E-5)
   10 MHz : ⊘RV102/DM-89(E-5)
   Specifications: 6 MHz : A = −10 ±3 ns
   10 MHz : B = 0 ±3 ns

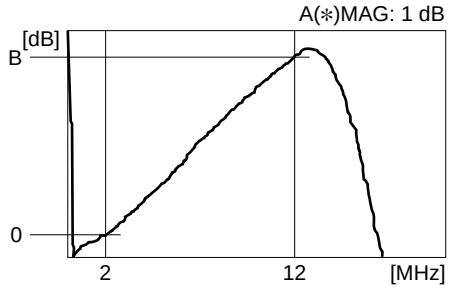
DNW-A75 only



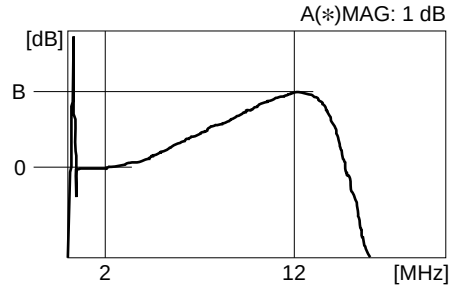
Main adjustment / METAL Y

7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Enter A33 : DM VR 2.
9. Adjust the level at 12 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-Y-A
   Specification: DNW-A75: B = +8.0 ± 0.5 dB
   DNW-A75P: B = +3.5 ± 0.5 dB

DNW-A75



DNW-A75P

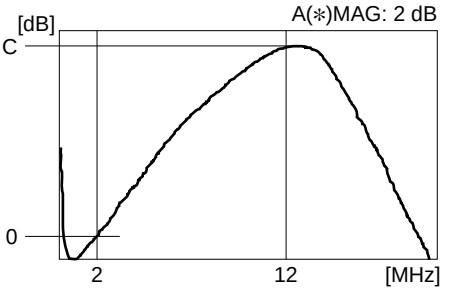


10. Set the data of "MAIN METAL-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-Y-A".
11. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / METAL Y

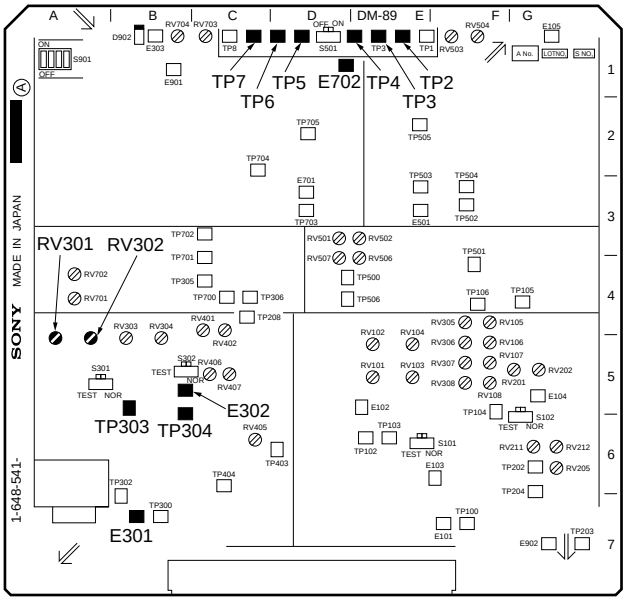
12. Enter A34 : DM VR 3.
13. For DNW-A75:
    Check that the data of "SUB METAL-Y-A" and "SUB METAL-Y-B" in A34 : DM VR 3 are B0. (If not, set them to B0.)
    For DNW-A75P:
    (1) Connect the oscilloscope's CH-2 input to TP2/DM-89(E-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 12 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-Y-A
    Specification: C = +16.5 ± 1.0 dB

DNW-A75P only



    (3) Set the data of "SUB METAL-Y-B" in A34 : DM VR 3 to the identical data value as "SUB METAL-Y-A".

14. To exit A34 : DM VR 3, press the MENU button once.
15. Disconnect the shorting clip from TP4/DM-89(E-1).



DM-89 Board (Side A)

3. METAL C Adjustment

1. Short-circuit TP6/DM-89(D-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

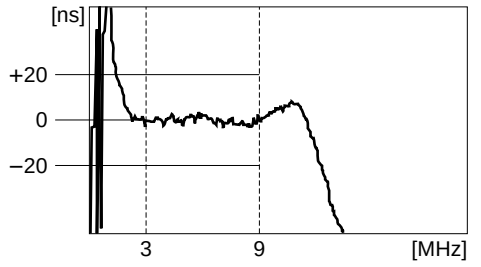
Note

The alignment tape (CR5-1B or CR5-1B PS) is still in the VTR. (STANDBY OFF mode)

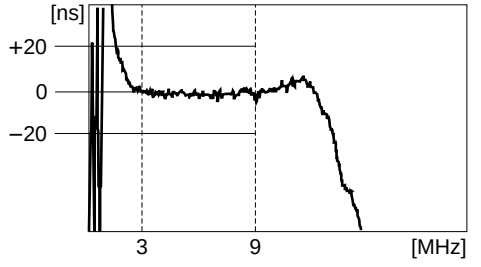
Group delay adjustment / METAL C

3. Connect the oscilloscope's CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
4. Adjust the group delay time in 3 MHz through 9 MHz.
   Adj. points: ⊘RV301/DM-89(A-5) and
   ⊘RV302/DM-89(A-5)
   Specification: 0 ±20 ns

DNW-A75



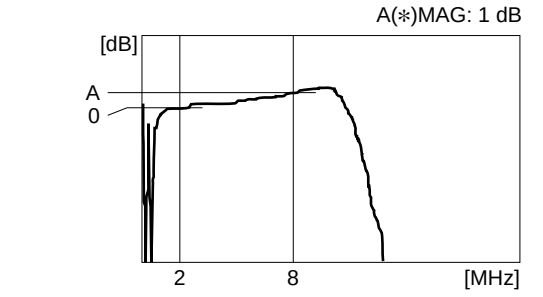
DNW-A75P



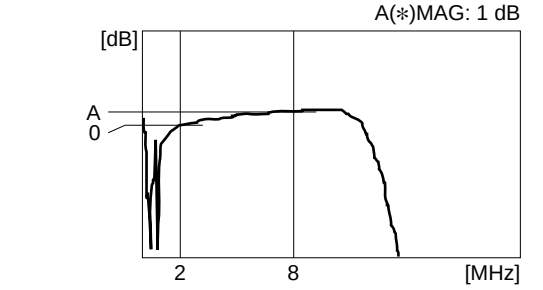
Main adjustment / METAL C

5. Enter A33 : DM VR 2.
6. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
7. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-C-A
   Specification: B = +0.5 ±0.5 dB

DNW-A75



DNW-A75P

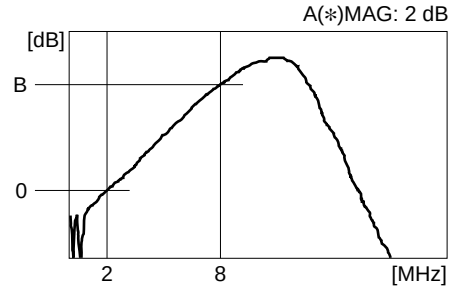


8. Set the data of "MAIN METAL-C-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-C-A".
9. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / METAL C

10. Enter A34 : DM VR 3.
11. For DNW-A75:
    Check that the data of “SUB METAL-C-A” and “SUB METAL-C-B” in A34 : DM VR 3 are 70. (If not, set them to 70.)
    For DNW-A75P:
    (1) Connect the oscilloscope’s CH-2 input to TP6/DM-89(D-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-C-Y
    Specification: B = +9.2 ± 1.0 dB

DNW-A75P only



    (3) Set the data of “SUB METAL-C-B” in A34 : DM VR 3 to the identical data value as “SUB METAL-C-A”.

12. To perform the tape operation, press the SET button once.
13. Eject the alignment tape.
14. To operate the maintenance mode, press the MENU button once.
15. To exit A34 : DM VR 3, press the MENU button once.

4. OXIDE C Adjustment

1. Insert the following alignment tape in order to set STANDBY OFF mode.
   DNW-A75: CR5-2A
   DNW-A75P: CR5-2A PS

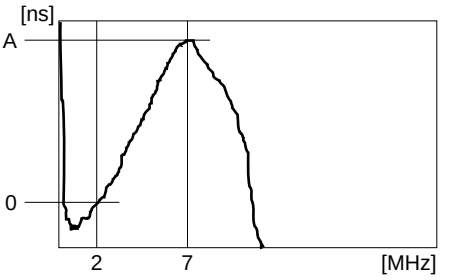
Notes

- Shorting clip is in short circuit between TP5/DM-89 (D-1) and E702/DM-89(D-1).
- The network analyzer’s output is in connection to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

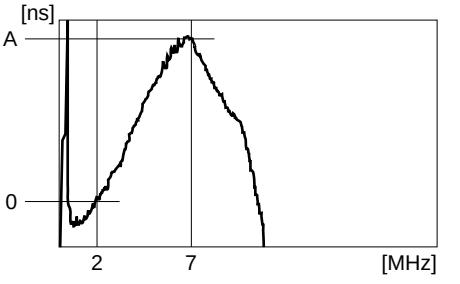
Group delay adjustment / OXIDE C

2. Connect the oscilloscope’s CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
3. Adjust the delay time at 7 MHz using 2 MHz as the reference.
   Adj. points: ⊘RV303/DM-89(B-5) and
   ⊘RV304/DM-89(B-5)
   Specification: A = 70 ±5 ns

DNW-A75



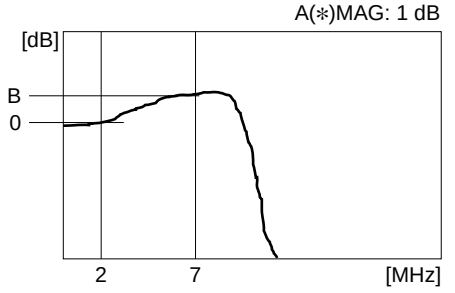
DNW-A75P



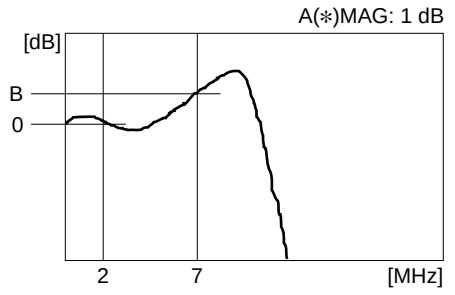
Main adjustment / OXIDE C

4. Enter A33 : DM VR 2.
5. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
6. Adjust the level at 7 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-C-A
   Specification: B = +1.2 ±0.5 dB

DNW-A75



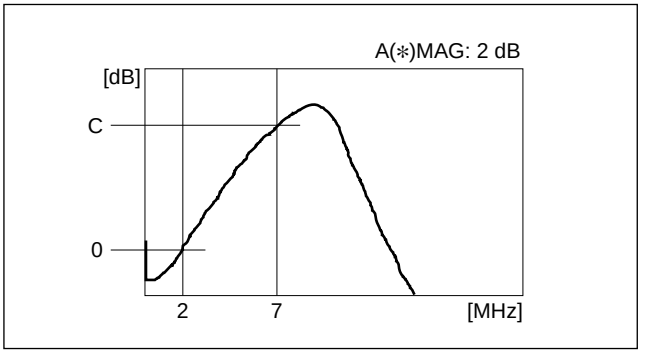
DNW-A75P



7. Set the data of "MAIN OXIDE-C-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-C-A".
8. To exit A33 : DM VR 2, press the MENU button once.

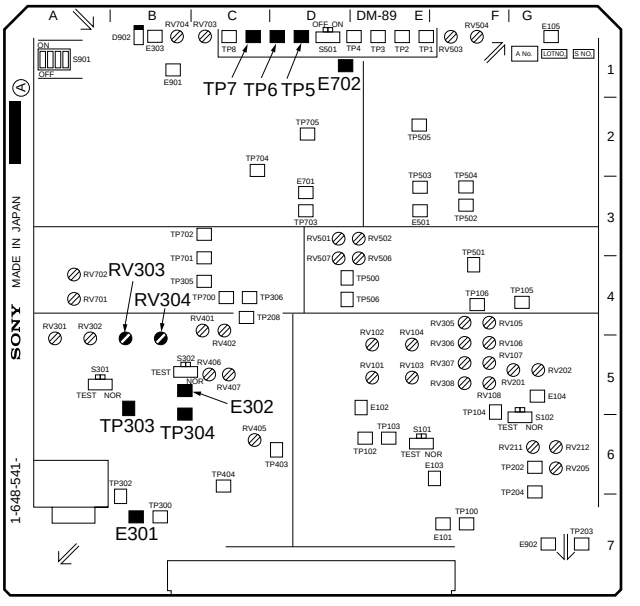
Sub adjustment / OXIDE C

9. Enter A34 : DM VR 3.
10. Connect the oscilloscope's CH-2 input to TP6/DM-89 (D-1). GND: E702/DM-89(D-1)
11. Adjust the level at 7 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB OXIDE-C-A
    Specification: C = +11.0 ±0.5 dB



12. Set the data of "SUB OXIDE-C-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-C-A".
13. To exit A34 : DM VR 3, press the MENU button once.

14. Disconnect the shorting clip from TP5/DM-89(D-1).



DM-89 Board (Side A)

5. OXIDE Y Adjustment

1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. When ⊘RV103/DM-89(E-5) is equipped, turn it fully counterclockwise (↺).
3. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)

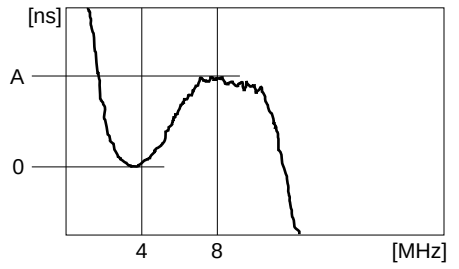
Note

The alignment tape (CR5-2A or CR5-2A PS) is still in the VTR. (STANDBY OFF mode)

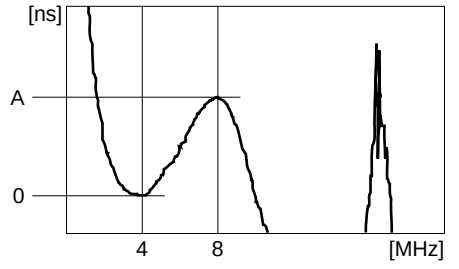
Group delay adjustment / OXIDE Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89(F-5). GND: E104/DM-89(G-5)
5. Adjust the delay time at 8 MHz using 4 MHz as the reference.
   Adj. point: ⊘RV104/DM-89(E-5)
   Specification: DNW-A75: A = 40 ± 5 ns
   DNW-A75P: A = 40 ± 3 ns

DNW-A75



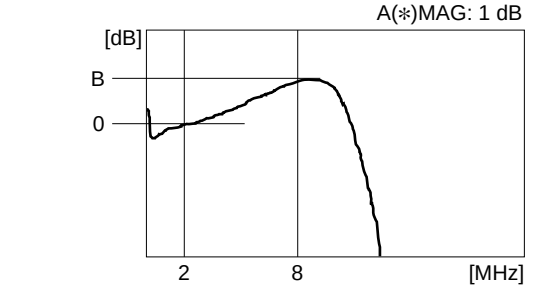
DNW-A75P



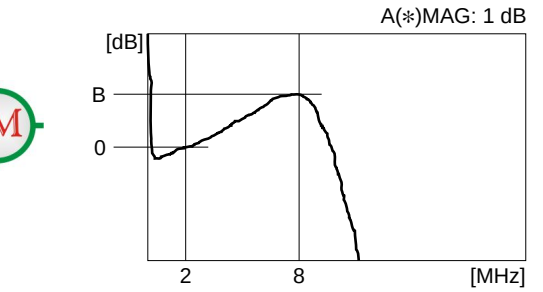
Main adjustment / OXIDE Y

6. Enter A33 : DM VR 2.
7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-Y-A
   Specification: DNW-A75: B = +2.0 ± 0.5 dB
   DNW-A75P: B = +2.5 ± 0.5 dB

DNW-A75



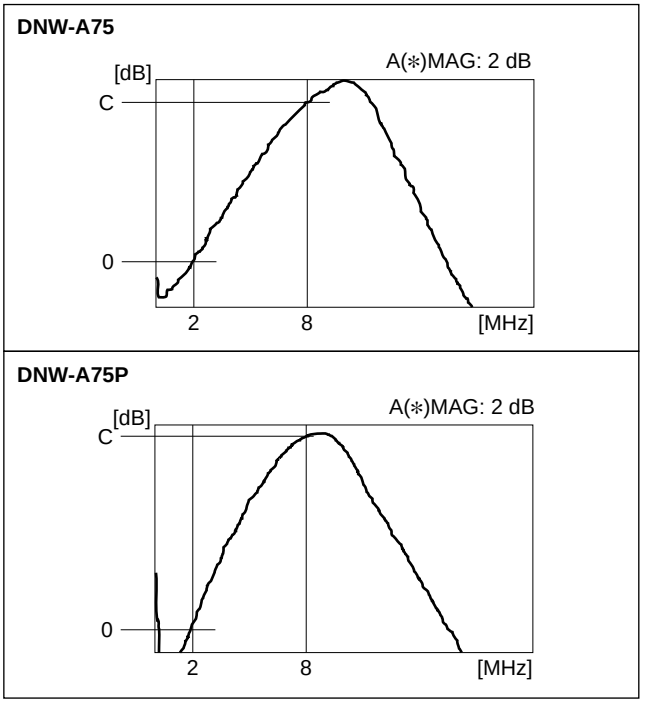
DNW-A75P



9. Set the data of "MAIN OXIDE-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-Y-A".
10. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / OXIDE Y

11. Enter A34 : DM VR 3.
12. Connect the oscilloscope's CH-2 input to TP2/DM-89 (E-1). GND: E702/DM-89(D-1)
13. Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A33 : DM VR 3 : SUB OXIDE-Y-A
    Specification: DNW-A75: C = +14.0 ±0.5 dB
    DNW-A75P: C = +17.0 ±0.5 dB



14. Set the data of "SUB OXIDE-Y-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-Y-A".

15. To perform the tape operation, press the SET button once.
16. Eject the alignment tape.
17. To operate the maintenance mode, press the MENU button once.
18. To exit A34 : DM VR 3, press the MENU button once.

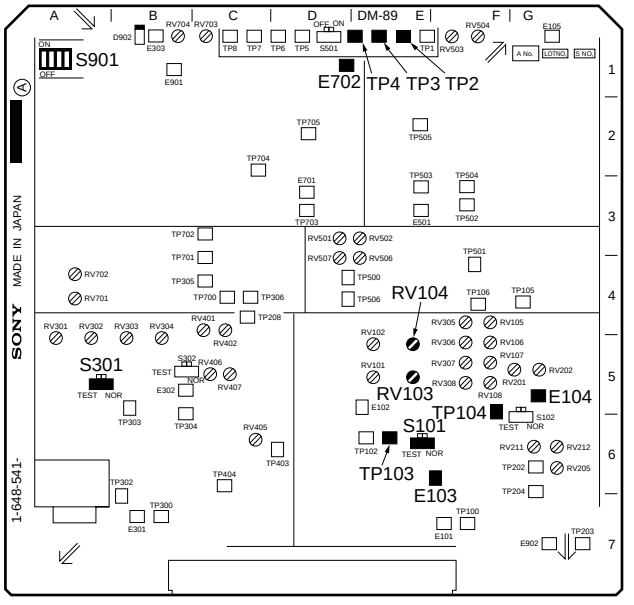
19. Remove the shorting clip between TP4/DM-89(E-1) and E702/DM-89(D-1).
20. Return S101/DM-89(E-6) and S301/DM-89(A-5) to "NOR" side (right side).
21. Return the switches No. 1 and No. 3 of S901/DM-89 (A-1) to OFF (down side).

6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
2. To exit the maintenance mode, press the MENU button four times.



DM-89 Board (Side A)

2-10-6. Cosine Equalizer Provisional Adjustment

Note

- This provisional adjustment explains how to adjust without using the network analyzer.
  When the performed "2-10-5. Cosine Equalizer Adjustment" using the network analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the network analyzer is not available. If this provisional adjustment is done, it is recommended to perform "2-10-5. Cosine Equalizer Adjustment" using the network analyzer.

Preparing tools

- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Settings of Adjustment Data (Check)

1. To enter the maintenance mode, press S1101(L-1) on the SS-63 board.
2. Set the specified data value to each item of the following sub-menus (A33 to A35) in A3 : BETACAM PB ADJUST .
   DNW-A75: DATA on 525/60 column
   DNW-A75P: DATA on 625/50 column

(A3 :BETACAM ADJUST) Sub-menu	Item	Setting data 525/60	625/50
A33 : DM VR 2	MAIN METAL-Y-A	CC	CC
	MAIN METAL-Y-B	CC	CC
	MAIN METAL-C-A	8F	8F
	MAIN METAL-C-B	8F	8F
	MAIN OXIDE-Y-A	A5	A5
	MAIN OXIDE-Y-B	A5	A5
	MAIN OXIDE-C-A	9F	9F
	MAIN OXIDE-C-B	9F	9F
A34 : DM VR 3	SUB METAL-Y-A	B0	C4
	SUB METAL-Y-B	B0	C4
	SUB METAL-C-A	70	70
	SUB METAL-C-B	70	70
	SUB OXIDE-Y-A	B1	B1
	SUB OXIDE-Y-B	B1	B1
	SUB OXIDE-C-A	A5	A5
	SUB OXIDE-C-B	A5	A5
A35 : DM VR 4	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0

3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

4. To exit the maintenance mode, press the MENU button four times.

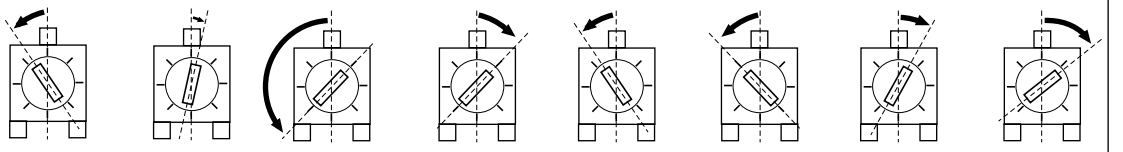
Settings of RVs

Set the following RVs on the DM-89 board to each specified position as shown figure below.

Note

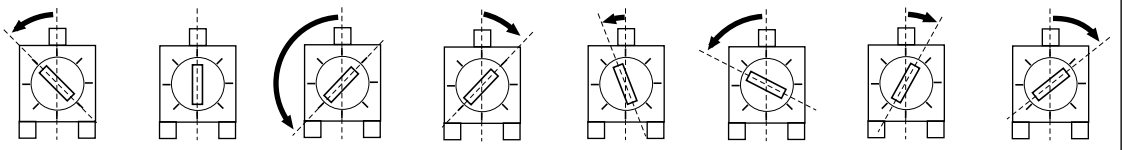
RV103 is not equipped on the DM-89 board of the LOT Nos. 407 and higher.

DNW-A75

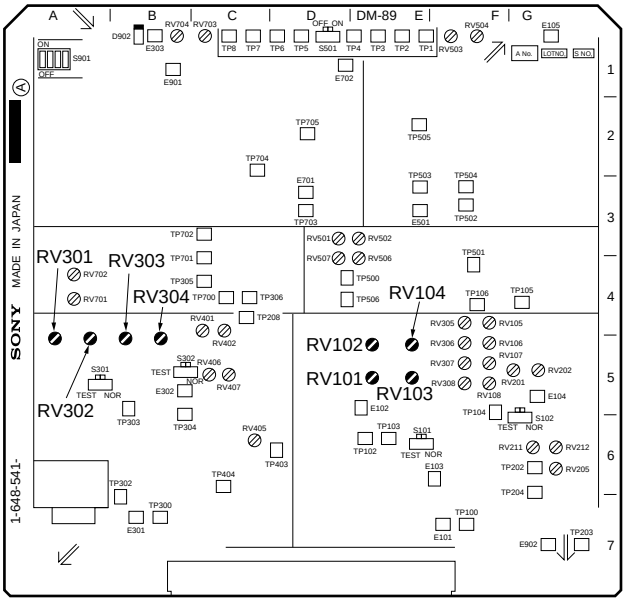


RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)

DNW-A75P



RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)



DM-89 Board (Side A)

2-10-7. DM RF Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

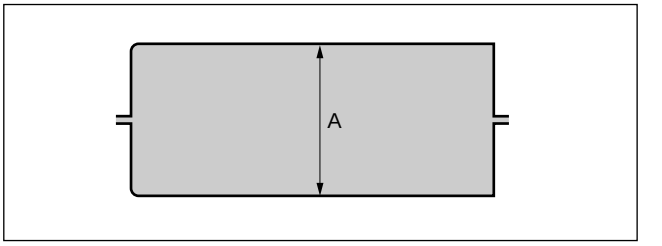
KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. METAL Y Adjustment

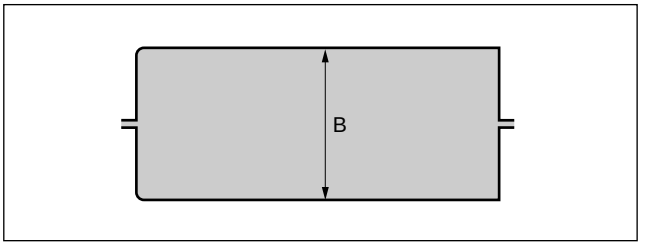
1. Connect and set the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), AC 100 mV/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV211/DM-89(G-6)
   Specification: A = 400 ± 40 mV p-p



3. Stop the playback of the alignment tape.

2. METAL C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV406/DM-89(C-5)
   Specification: B = 400 ± 40 mV p-p



3. Eject the alignment tape.

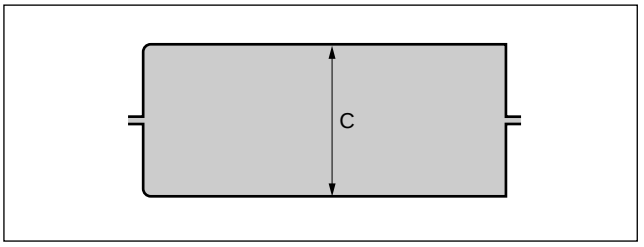
http://getMANUAL.com

3. OXIDE C Adjustment

Note

Connection of the oscilloscope remains unchanged.

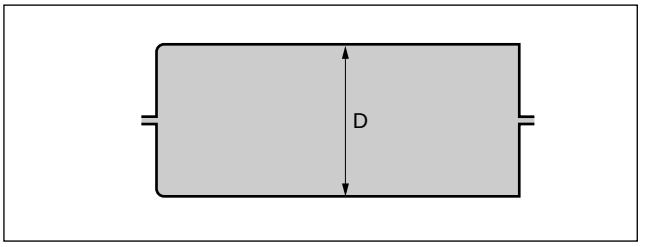
1. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV407/DM-89(C-5)
   Specification: C = 400 ±40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y Adjustment

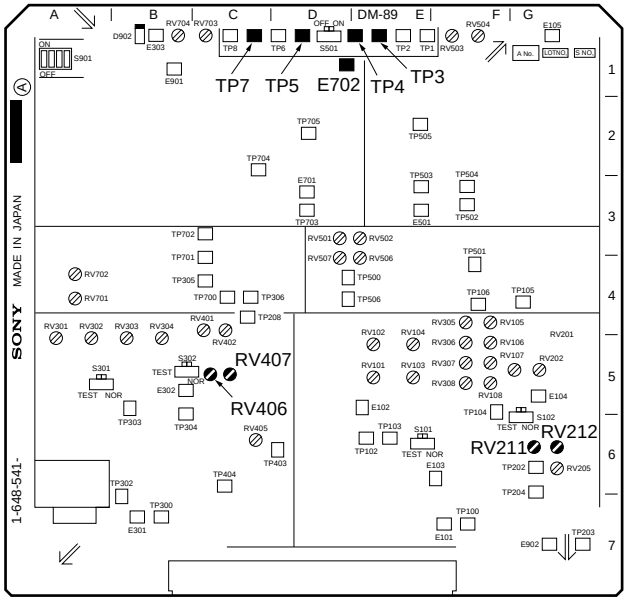
1. Change the connection of the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV212/DM-89(G-6)
   Specification: D = 400 ±40 mV p-p



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-8. OMC Carrier Balance Adjustment”.



DM-89 Board (Side A)

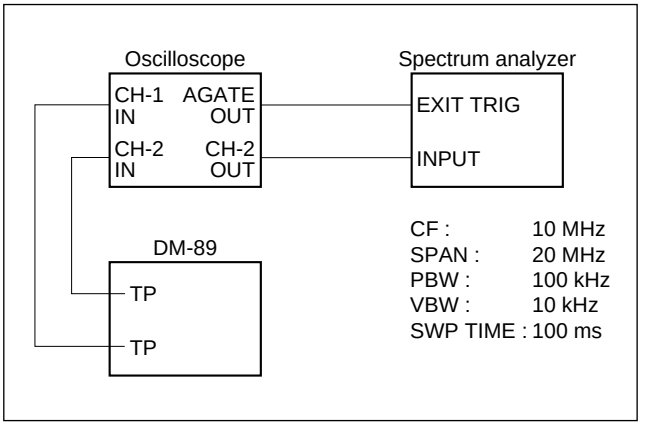
2-10-8. OMC Carrier Balance Adjustment

Note

If the network analyzer is not available, perform "2-10-9. OMC Carrier Balance Provisional Adjustment".

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Spectrum Analyze

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing the DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

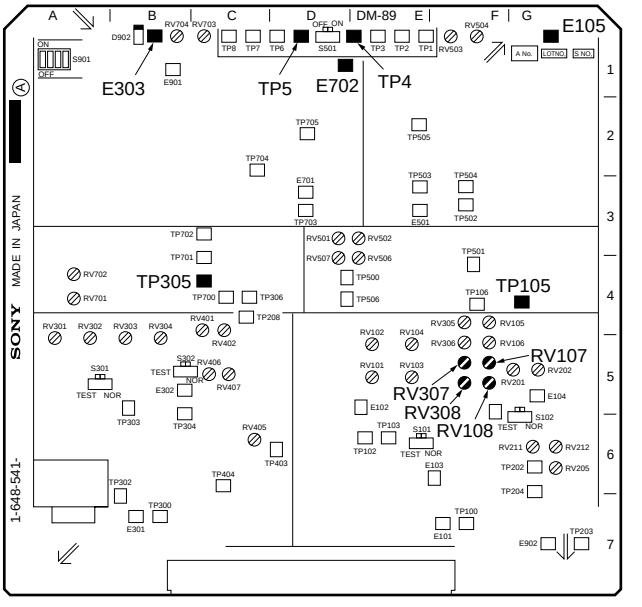
KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)

6. Check that the equipment has warmed up.

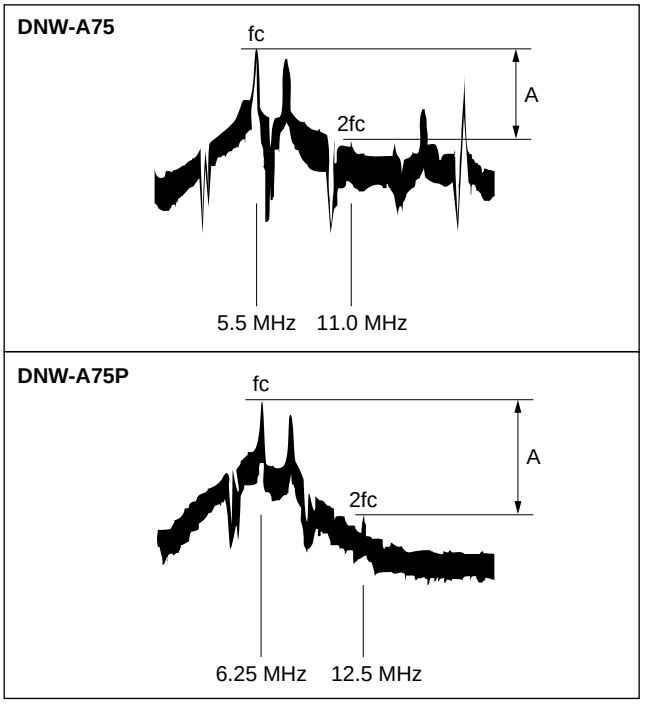
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.



DM-89 Board (Side A)

1. OXIDE Y Adjustment

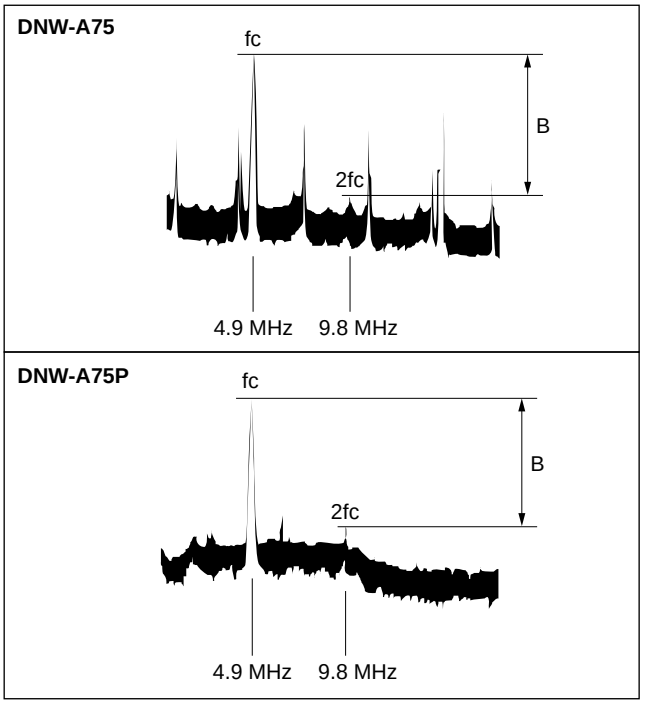
1. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), AC 1 V/DIV
   GND: E105/DM-89(G-1)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
   Specification: A ≧ 35 dB



3. Stop the playback of the alignment tape.

2. OXIDE C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
   CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
   Specification: B ≧ 35 dB



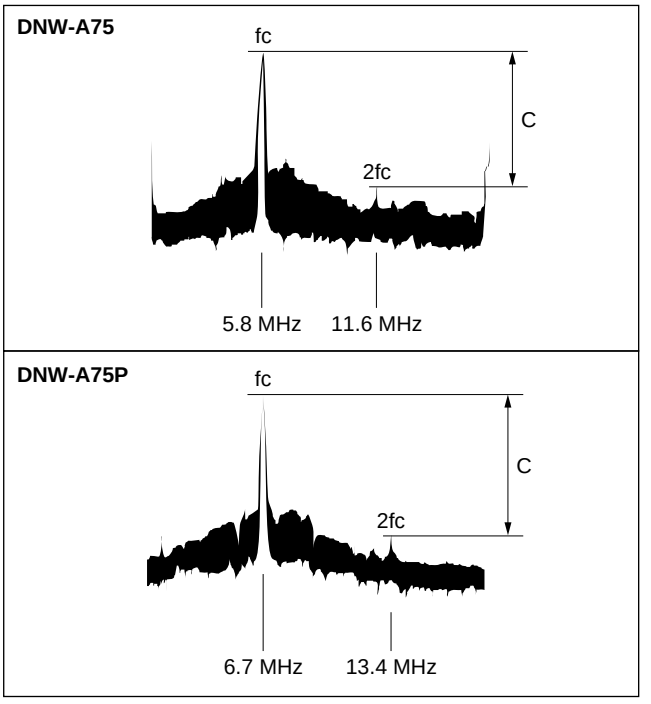
3. Eject the alignment tape.

3. METAL C Adjustment

Note

Connection of the oscilloscope remains unchanged.

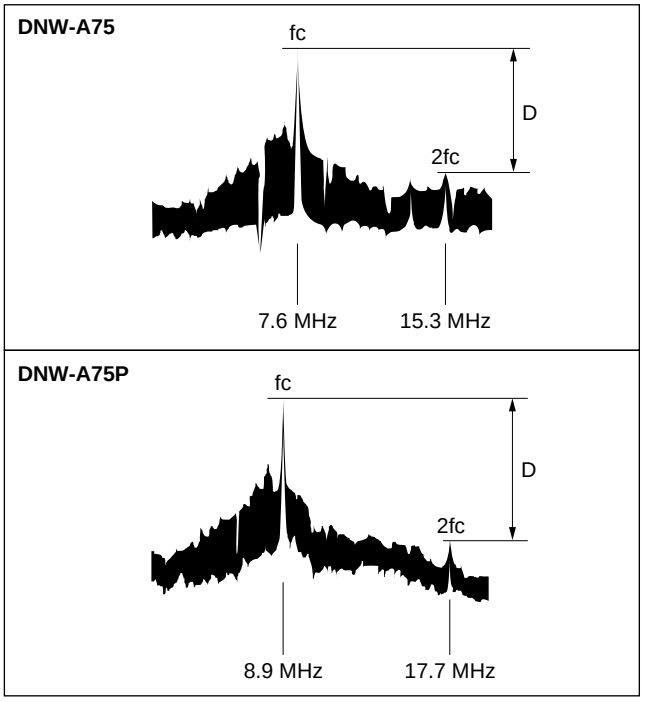
1. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
   Specification: C ≧ 40 dB



2. Stop the playback of the alignment tape.

4. METAL Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
   Specification: D ≧ 40 dB



3. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “2-10-10. Demodulator Limiter Balance Adjustment”.

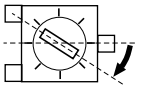
2-10-9. OMC Carrier Balance Provisional Adjustment

Notes

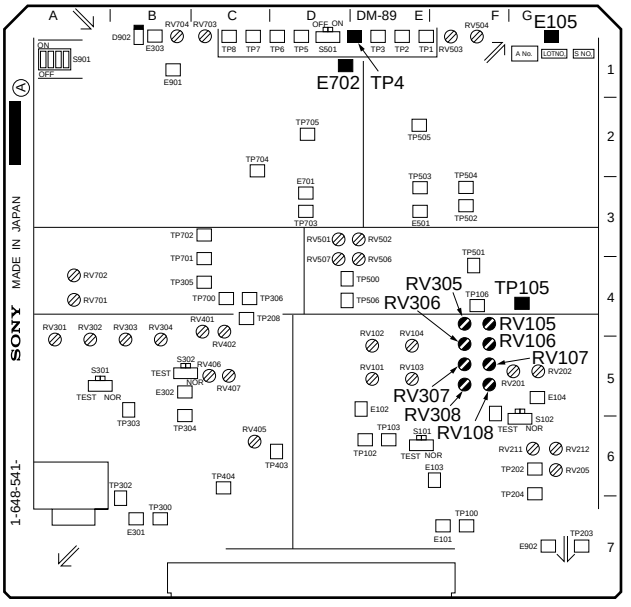
- This provisional adjustment explains how to adjust without using the spectrum analyzer.
  When the performed “2-10-8. OMC Carrier Balance Adjustment” using the spectrum analyzer, this provisional adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to perform “2-10-8. OMC Carrier Balance Adjustment” using the spectrum analyzer.

Settings of RVs

Set the following RVs on the DM-89 board to specified position respectively as shown below.



RV105 (F-4)
RV106 (F-5)
RV107 (F-5)
RV108 (F-5)
RV305 (F-4)
RV306 (F-5)
RV307 (F-5)
RV308 (F-5)



DM-89 Board (Side A)

2-10-10. Demodulator Limiter Balance Adjustment

Note

For the Y adjustment:
When the spectrum analyzer is not available for an urgent maintenance, omit steps 2 through 4 in the Y adjustment. If step 1 is done only, be sure to perform the steps 2 through 4 in the Y adjustment at a later date.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

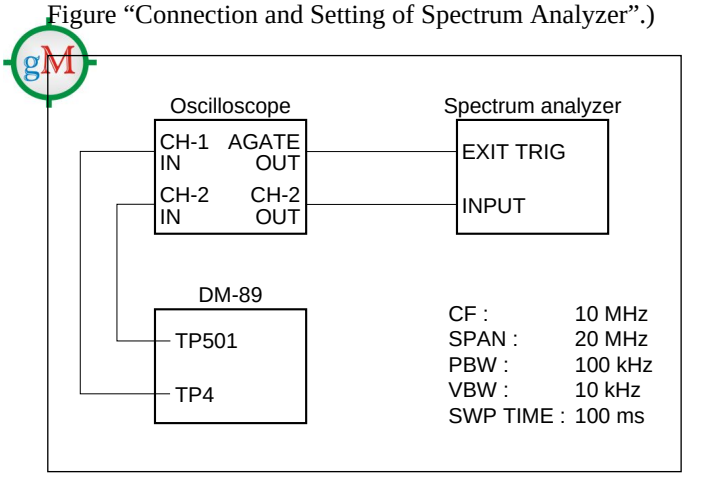
REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)



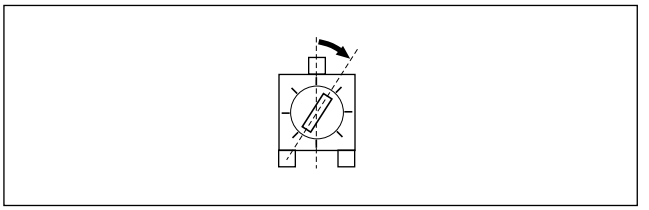
Connection and Setting of the Spectrum Analyzer

6. Check that the equipment has warmed up.

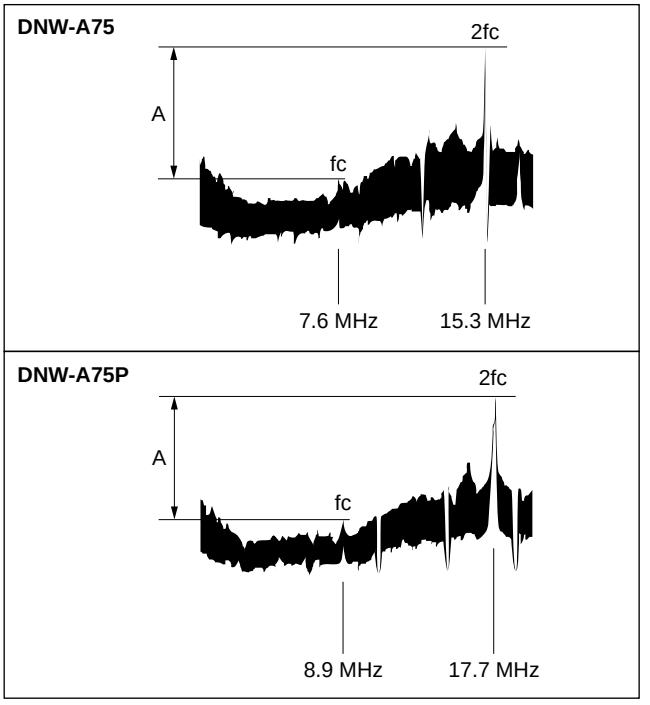
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Y Adjustment

1. Set RV502/DM-89(E-3) to the specified position as shown figure below.



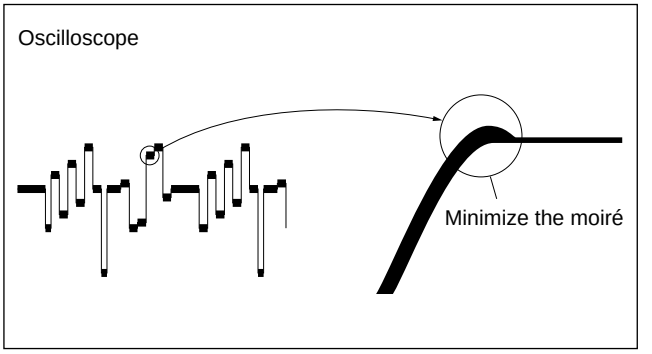
2. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP501/DM-89(F-4), AC 1 V/DIV
   GND: E501/DM-89(E-3)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
3. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV502/DM-89(E-3)
   Specification: Maximize the level difference A. (Minimize the fc.)



4. Stop the playback of the alignment tape.

2. C Adjustment

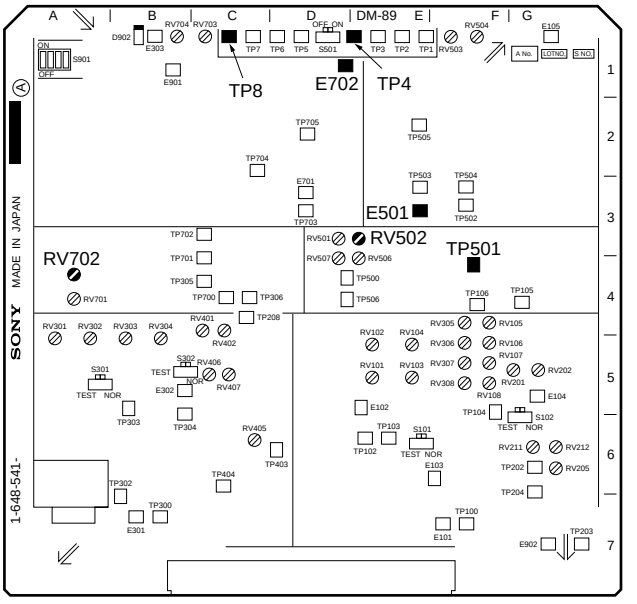
1. Connect and set the oscilloscope as follows:
   CH-1: TP8/DM-89(C-1), AC 200 mV/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the moiré of specified part on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV702/DM-89(A-4)
   Specification: Minimize the moiré of specified part.



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "2-10-11. Non-Liner Output Level Adjustment".



DM-89 Board (Side A)

2-10-11. Non-Liner Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNWA-75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNWA-75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

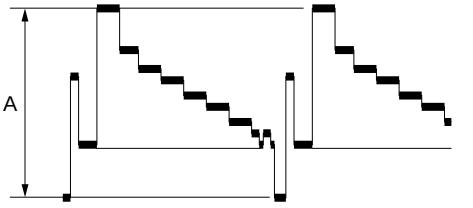
5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

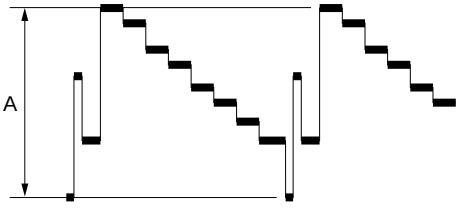
1. METAL Y Adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), AC 200 mV/DIV
   GND: E501/DM-89(E-3)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV503/DM-89(F-1)
   Specification: A = 1.00 ± 0.01 V

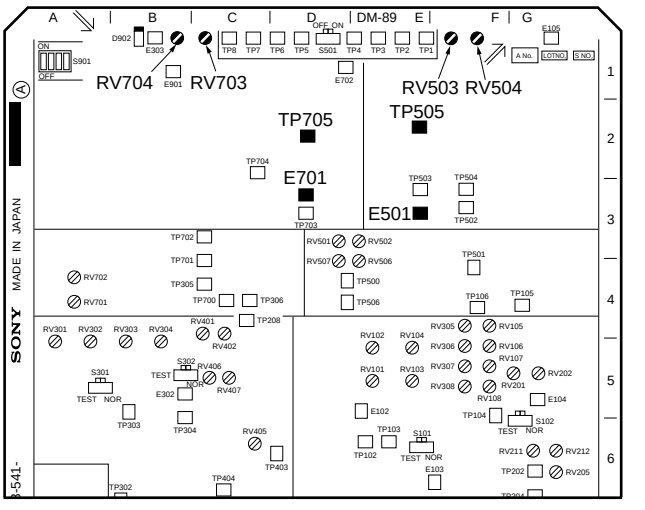
DNW-A75



DNW-A75P



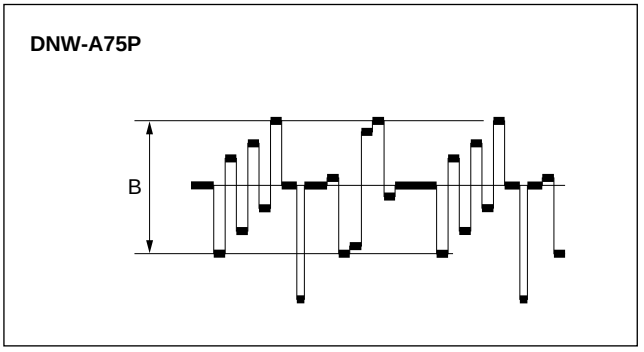
3. Stop the playback of the alignment tape.



DM-89 Board (Side A)

2. METAL C Adjustment for DNW-A75P Only

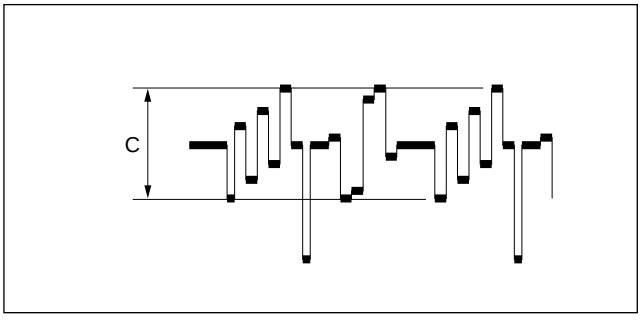
1. Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 100% color-bar signal (14:00 to 17:00) of CR5-1B PS
   Adj. point: ⊘RV703/DM-89(C-1)
   Specification: B = 933 ±10 mV



3. Eject the alignment tape.

4. METAL C (DNW-A75) / OXIDE C (DNW-A75P) Adjustment

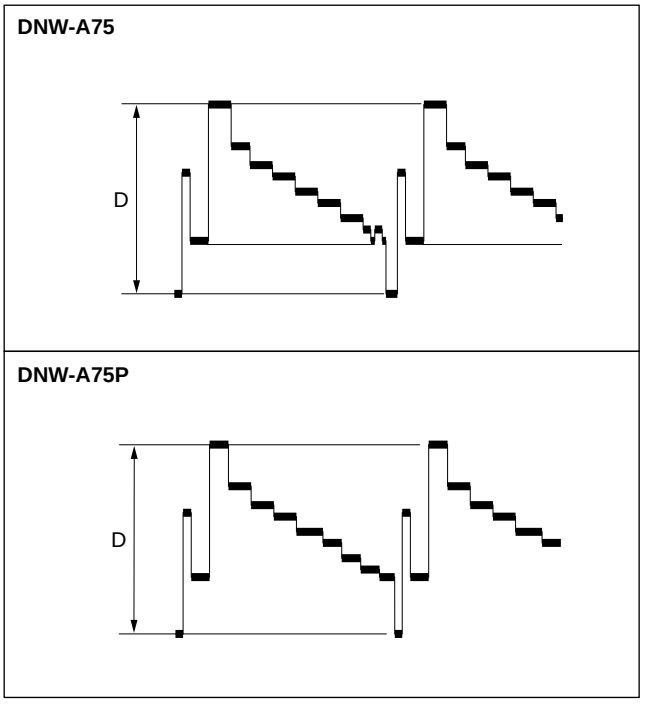
1. Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal
   DNW-A75: 14:00 to 17:00 in CR5-1B
   DNW-A75P: 0:00 to 3:00 in CR5-2A PS
   Adj. point: ⊘RV704/DM-89(B-1)
   Specification: C = 700 ±10 mV



3. Stop the playback of the alignment tape.
4. For DNW-A75 only: Eject the alignment tape.

3. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), GND: E501/DM-89(E-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV504/DM-89(F-1)
   Specification: D = 1.00 ±0.01 V



3. Eject the alignment tape.

2-10-12. PB Frequency Response Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the DM-89 and TBC-23A boards.

Reset the switch settings on the DM-89 and TBC-23A boards to the factory settings. (Refer to step 1 in “2-10-2. Common Preparation”.)

4. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

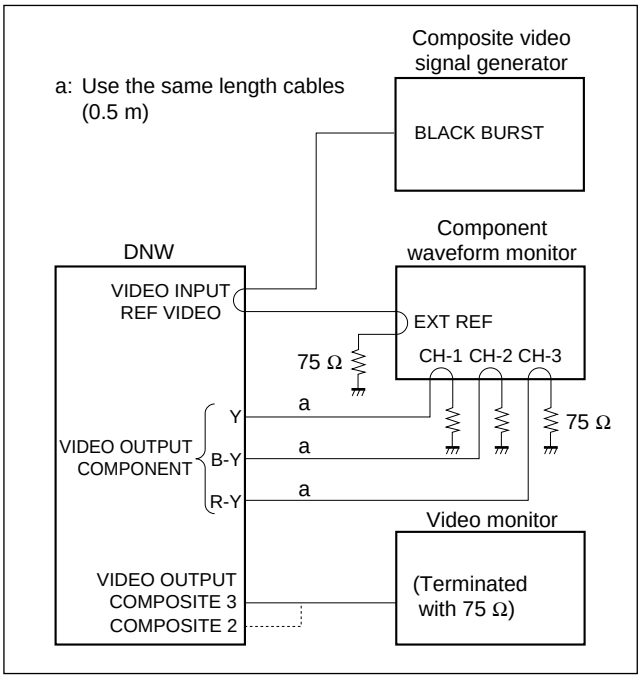
5. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

http://getMANUAL.com

6. Connect the equipment.

(Refer to Figure “Connection”.)



Connection

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A32 : DM VR 1.

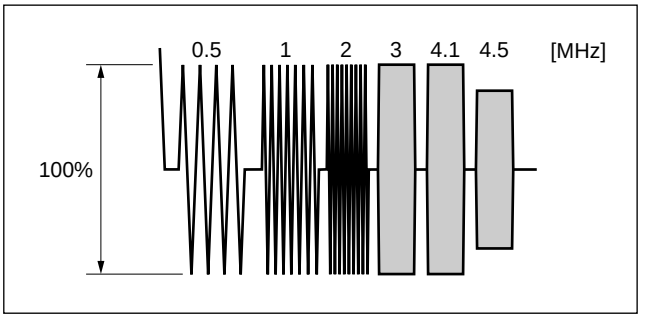
3. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, check that the data of all items in A32 : DM VR 1 are the initial data value.
   (Refer to Section 2-10-3 for the initial data. If not, set them to the initial data.)
4. To perform the tape operation, press the SET button once.

2. METAL Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A75) / 2T BAR (DNW-A75P) .
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 4.1 MHz (DNW-A75) / 5 MHz (DNW-A75P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
   Specification (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specification (A and B channels):
   See the table below.
8. Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
9. During play back the alignment tape in PLAY mode, check the playback picture on the video monitor.
   PB portion: The same as step 2
   Specification: It has not flicker.
10. Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

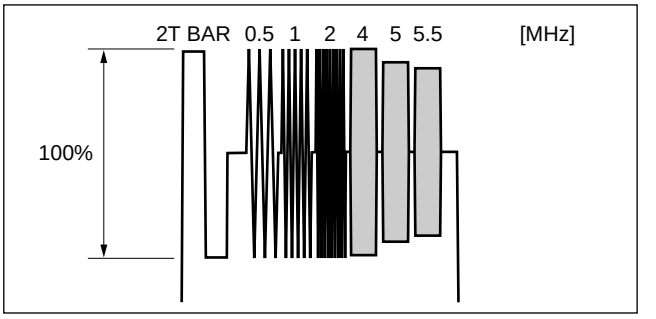
Specifications for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)
4.1 MHz	Adjust: 94% (100 to 90%) {−0.5 $^{+0.5}_{-0.4}$ dB}
1 MHz 2 MHz 3 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check: 80% (106 to 63%) {−2.0 $^{+2.5}_{-2.0}$ dB}



Specifications for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 2T BAR is 100% {0 dB}.)
5 MHz	Adjust: 91% (96 to 87%) {−0.8 ±0.4 dB}
0.5 MHz 1 MHz 2 MHz 4 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check: 84% (106 to 63%) {−1.5 $^{+2.0}_{-2.5}$ dB}

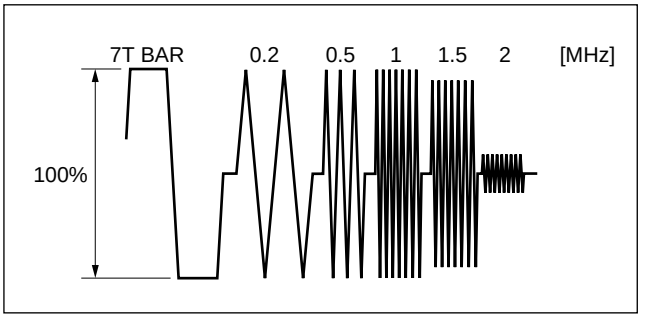


3. METAL C Adjustment

1. Watch the R-Y output signal on the analog component waveform monitor.
   Note
   As the R-Y(B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A75) / 8T BAR (DNW-A75P).
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz (DNW-A75) / 1.5 MHz (DNW-A75P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-C-A
   B channel: A32 : DM VR 1 : EQ1 METAL-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.

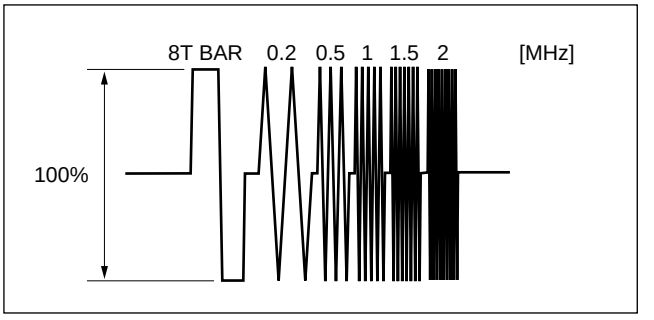
Specifications for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{−0.5 ±0.5 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 63%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 8T BAR is 100% {0 dB}.)	
1.5 MHz	Adjust: 93% (102 to 85%)	{−0.6 ±0.8 dB}
0.2 MHz 0.5 MHz 1 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



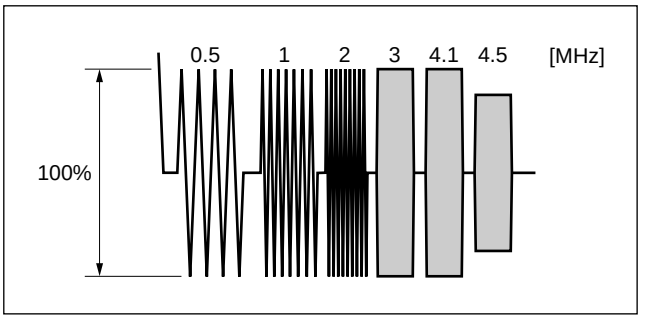
4. OXIDE Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A75) / 2T BAR (DNW-A75P).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 2 MHz (DNW-A75) / 3 MHz (DNW-A75P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. During play back the alignment tape in PLAY mode, check the output level difference between A and B channels at high frequency (4.5 MHz) part.
   PB portion: The same as step 2
   Specification: It is not noticeable.
   Note
   If the output level difference of A and B channels at 4.5 MHz part is noticeable, change the data of "SUB OXIDE-Y-A" or "SUB OXIDE-Y-B" in A34 : DM VR 3 as following steps (1) to (8).

(1) To operate the maintenance mode, press the MENU button once.
(2) To exit A32 : DM VR 1, press the MENU button once.
(3) Enter A34 : DM VR 3.
(4) Change the data of "SUB OXIDE-Y-A" (A channel side), and judge a lower level channel.

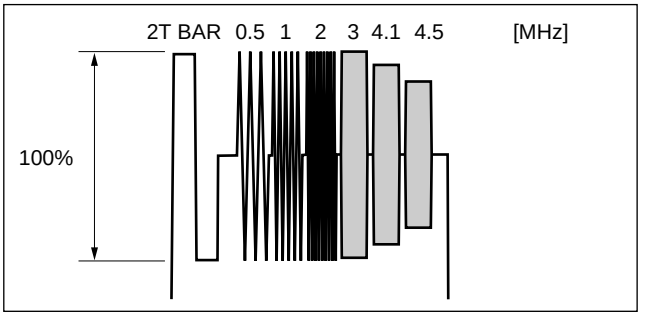
Specifications for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)
2 MHz	Adjust: 100% (104 to 95%) {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check: 89% (106 to 50%) {−1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {−3.0 $^{+3.5}_{-3.0}$ dB}



Specifications for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 2T BAR is 100% {0 dB}.)
3 MHz	Adjust: 89% (100 to 79%) {−1.0 ±1.0 dB}
0.5 MHz 1 MHz, 2 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {−3.0 $^{+3.5}_{-3.0}$ dB}



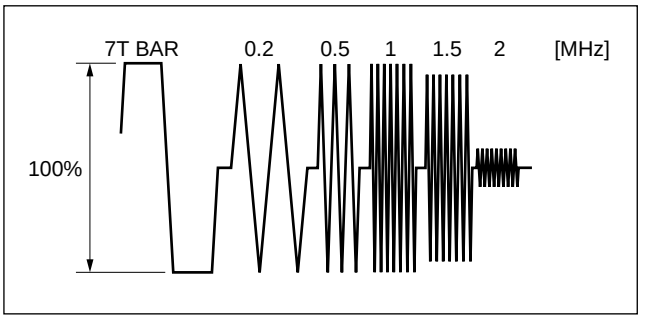
(5) If the B channel side is lower: Return the data of "SUB OXIDE-Y-A" to the former data, then adjust (add to the data value) "SUB OXIDE-Y-B" until the level at 4.5 MHz of B channel is equal to the level at 4.5 MHz of A channel.
If the A channel side is lower: Adjust (add to the data value) "SUB OXIDE-Y-A" until the level at 4.5 MHz of A channel is equal to the level at 4.5 MHz of B channel.
(6) To exit A34 : DM VR 3, press the MENU button once.
(7) Enter A32 : DM VR 1.
(8) To perform the tape operation, press the SET button once.

5. OXIDE C Adjustment

1. Watch the R-Y output signal at the analog component waveform monitor.
   Note
   As the R-Y (B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A75) / 8T BAR (DNW-A75P).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz.
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.
11. To operate the maintenance mode, press the MENU button once.
12. To exit A32 : DM VR 1, press the MENU button once.

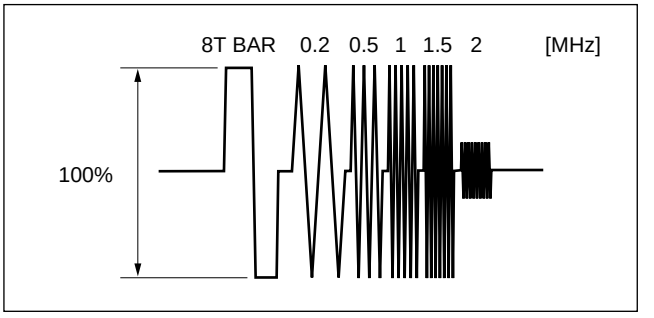
Specifications for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{–0.5 ±0.5 dB}
0.2 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check: 95% (106 to 71%)	{–0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{–2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for DNW-A75P

Frequency	Specification for DNW-A75P (level at 8T BAR is 100% {0 dB}.)	
1 MHz	Adjust: 94% (102 to 86%)	{–0.5 ±0.8 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 84% (106 to 71%)	{–1.5 $^{+2.0}_{-1.5}$ dB}



6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.
   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
2. To exit the maintenance mode, press the MENU button four times.

2-10-13. Drop-out Compensation Equalizer Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

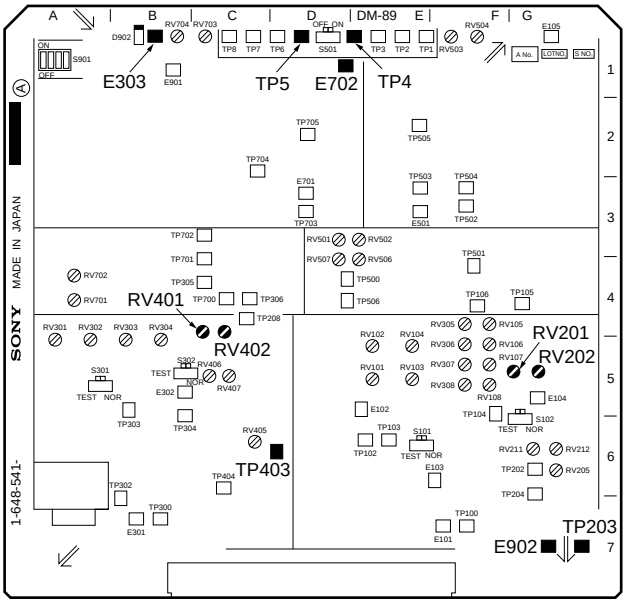
REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

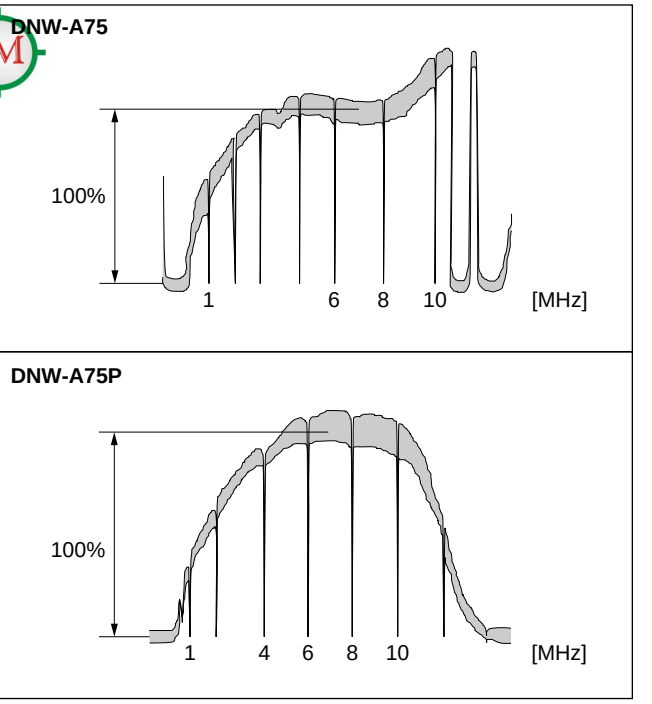
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



DM-89 Board (Side A)

1. METAL Y Adjustment

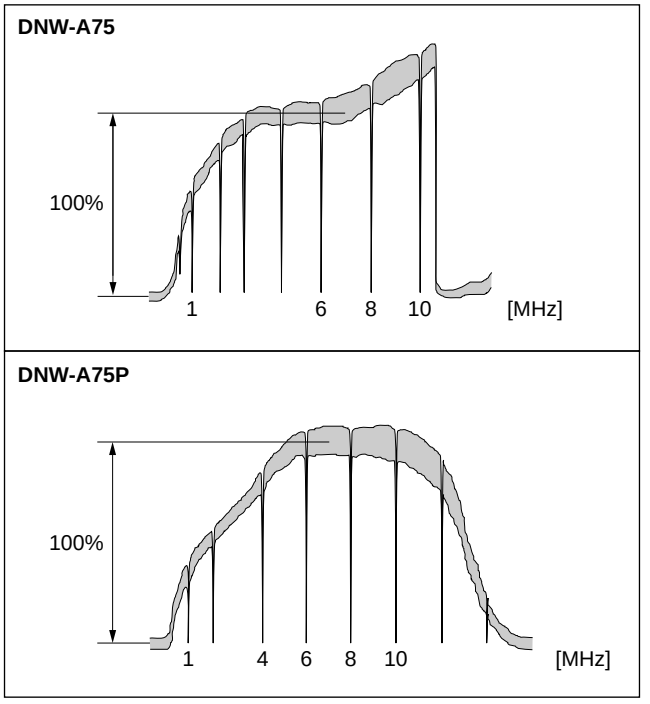
1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC >200 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ⊘RV201/DM-89(G-5)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ± 20 % {0 ± 2.0 dB}
   10 MHz: DNW-A75: 120 $^{+50}_{-20}$ % {2.0 $^{+5.0}_{-2.0}$ dB}
   DNW-A75P: 110 $^{+40}_{-20}$ % {1.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.

2. METAL C Adjustment

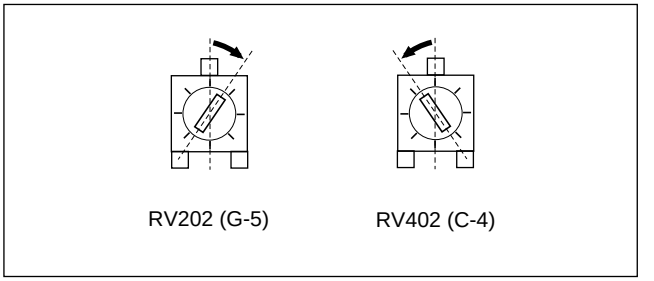
1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ⊘RV401/DM-89(G-4)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ± 20 % {0 ± 2.0 dB}
   10 MHz: 110 $^{+40}_{-20}$ % {2.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent "2-10-14. DM RF Output Level Readjustment".

3. OXIDE Y/C Adjustment

Set the following RVs on the DM-89 board to each specified position as shown figure below.



2-10-14. DM RF Output Level Readjustment

Readjust the DM RF output level referring to Section 2-10-7 again.

2-10-15. RF Envelope Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. Threshold Level Setting (Check)

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A36 : DM VR 5, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.)

Item (A36 : DM VR 5)	Setting data
ENV-TH-H	20
ENV-TH-L	10

3. To exit A36 : DM VR 5, press the MENU button once.

Data save (Store the adjusted data)

When the data was not changed in step 2, skip over to step 6.

4. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

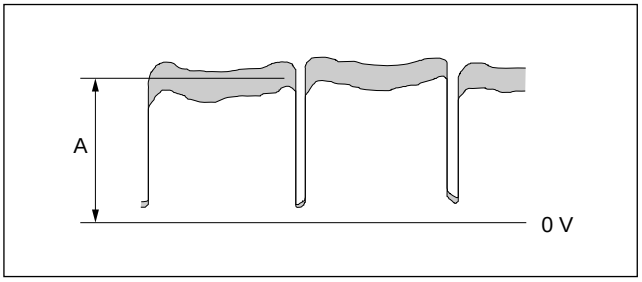
   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
5. To exit A3F : NV-RAM CONTROL, press the MENU button once.

6. To exit the maintenance mode, press the MENU button three times.

2. Y Adjustment

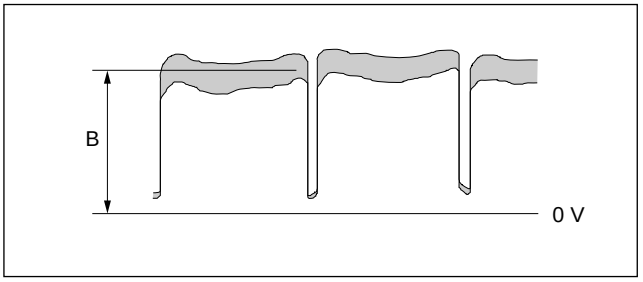
1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC 500 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 5 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV205/DM-89(G-6)
   Specification: A = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

3. C Adjustment

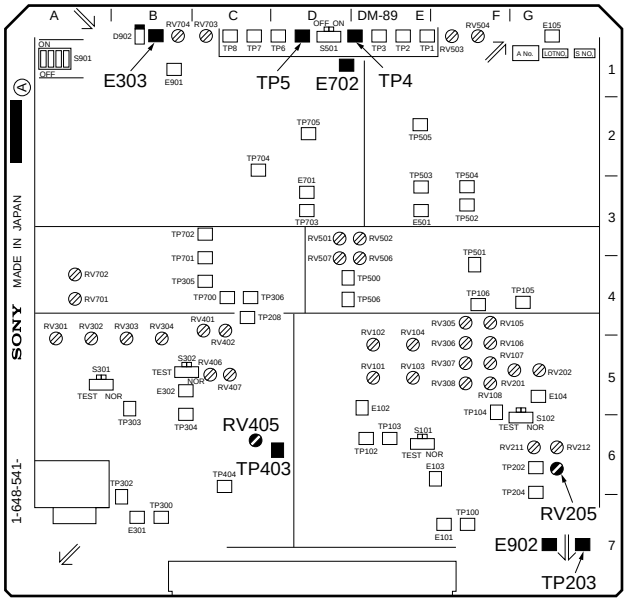
1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6)
   GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1)
   GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV405/DM-89(C-6)
   Specification: B = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-16. Search Picture Adjustment”.



DM-89 Board (Side A)

2-10-16. Search Picture Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Voltage Adjustment

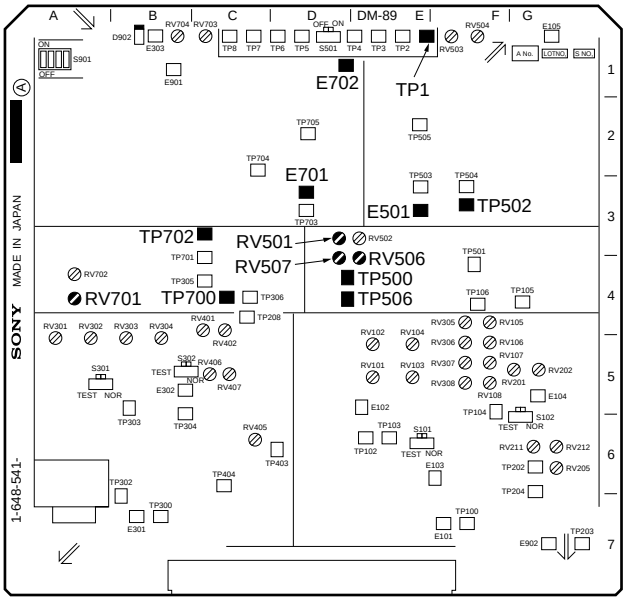
1. During play back the alignment tape in PLAY mode, using the digital voltage meter, measure each DC level at the following measurement points and fill up their measured levels on the following table.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS

Measurement point	Measured DC level (fill up)
TP500/DM-89(D-4)	_____
TP502/DM-89(F-3)	_____
TP702/DM-89(C-3)	_____

2. Stop the playback of the alignment tape.
3. Turn RV507/DM-89(D-4) fully clockwise (↻).
4. Short-circuit TP506/DM-89(D-4) and E501/DM-89 (E-3) with a shorting clip.
5. Short-circuit TP700/DM-89(C-4) and E701/DM-89 (D-3) with a shorting clip.
6. During play back the alignment tape in PLAY mode, adjust each DC level at the following measurement points.
   PB portion: The same as step 1
   Specification: The same measured DC level as step 1

Measurement point	Adjustment point	Remarks
TP500/DM-89(D-4)	⊘RV506/DM-89(E-4)	SPD OFFSET
TP502/DM-89(F-3)	⊘RV501/DM-89(D-3)	Y DEEM
TP702/DM-89(C-3)	⊘RV701/DM-89(A-4)	C DEEM

7. Remove the two shorting clips from DM-89 board.



DM-89 Board (Side A)

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2. Gain Adjustment

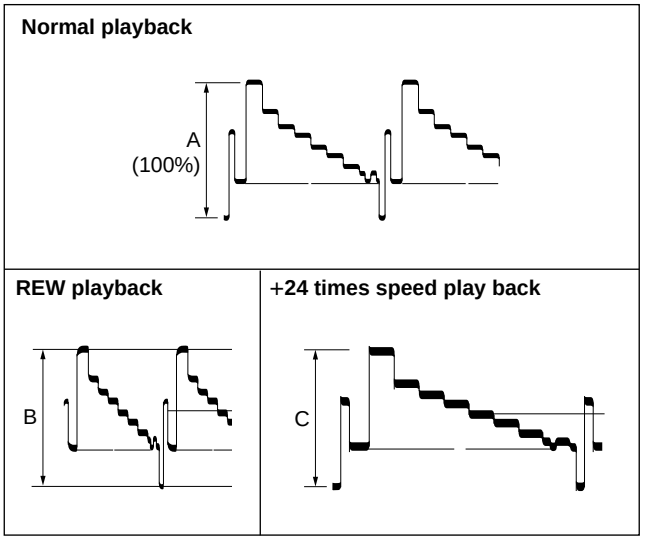
1. Connect and set the oscilloscope as follows:
   CH-1: TP1/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, measure level of A on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   This measured level A is reference level 100% (0 dB).
3. During play back the alignment tape in the following playback mode, adjust the level of B on the oscilloscope.
   PB portion: The same as step 2
   DNW-A75: REW playback
   DNW-A75P: +24 times speed playback
   Adj. point: ⊘RV507/DM-89(D-4)
   Specification (Level in Normal PB is 100% {0 dB}.):
   DNW-A75: B = 100 ±3 % (0 ±0.2 dB)
   DNW-A75P: B = 105 ±5 % (0.4 ±0.4 dB)
4. During play back the alignment tape in the following playback mode, check level of C on the oscilloscope.
   PB portion: The same as step 2
   DNW-A75: +24 times speed playback
   DNW-A75P: REW playback
   Specification (Level in Normal PB is 100% {0 dB}.):
   C = 100 ±10 % (0 ±1.0 dB)
5. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-17. Pairing Check”.

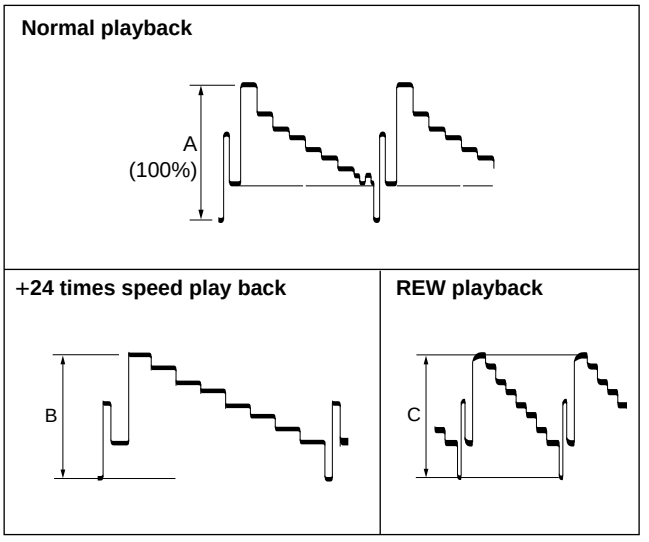
Specifications for DNW-A75

Playback mode	Specification for DNW-A75 (Level A in normal speed is 100% {0 dB}.)
REW	Adjust: B = 100 ±3 % (0 ±0.2 dB)
+24 times speed	Check: C = 100 ±10 % (0 ±1.0 dB)



Specifications for DNW-A75P

Playback mode	Specification for DNW-A75P (Level A in normal speed is 100% {0 dB}.)
+24 times speed	Adjust: B = 105 ±5 % (0.4 ±0.4 dB)
REW	Check: C = 100 ±10 % (0 ±1.0 dB)



2-10-17. Pairing Check

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

2. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Set the switches on the sub control panel.

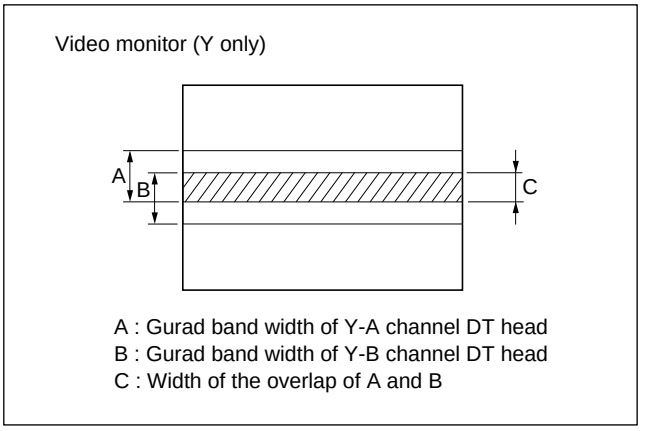
CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

1. METAL Pairing Check

1. Turn the switch No. 2 of S1/TBC-23A(B-2) to ON (up side).
2. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
3. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button (Enters the JOG mode.)
   (2) Press the STOP button (Enters the STOP mode.)
4. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the DT system adjustment (Sections 2-5-6 and 2-5-9).
   Specification : C > A/3 (or C > B/3)


Video monitor (Y only)
A
B
C
A : Gurad band width of Y-A channel DT head
B : Gurad band width of Y-B channel DT head
C : Width of the overlap of A and B

Guard Band

5. Eject the alignment tape.

2. OXIDE Pairing Check

1. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-2A / CR5-2A PS
2. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)
3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the DT system adjustment (Sections 2-5-6 and 2-5-9).
   Specification : C > A/3 (or C > B/3)
   (See the above figure.)
4. Eject the alignment tape.
5. Return the switch No. 2 of S1/TBC-23A(B-2) to OFF (down side).

2-10-18. Guard Band Width Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

2. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

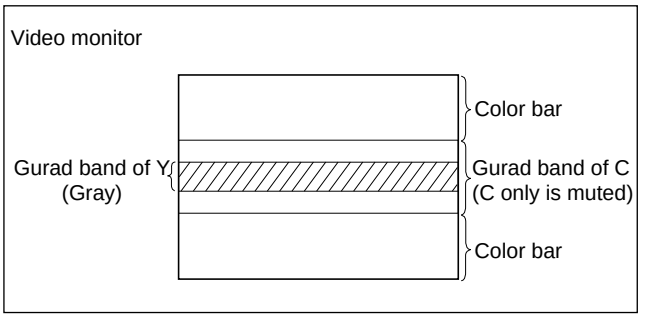
Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A35 : DM VR 4.
3. When the DM-89 board or NV-RAM (IC908/DM-98) was replaced only, check that the data of the following items in A35 : DM VR 4 are the initial data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the initial data.)
   - GUARD BAND METAL-Y
   - GUARD BAND METAL-C
   - GUARD BAND OXIDE-Y
   - GUARD BAND OXIDE-C
4. To perform the tape operation, press the SET button once.
5. Set the CHARACTER switch to OFF.

2. METAL Guard Band Width Check

1. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
2. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)



Guard Band

3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the following steps (1) through (5).
   Specification 1: Guard band width is below a third of video display screen's height.
   Specification 2: Width of C side > Width of Y side

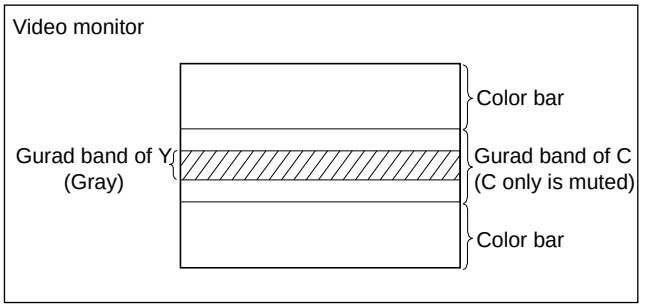
If the specification 1 or 2 is not satisfied (METAL)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
   Subtract 1 from each data of "GUARD BAND METAL-Y" and "GUARD BAND METAL-C" in A35 : DM VR 4.
   When the specification 2 is not satisfied:
   Add 1 to the data of "GUARD BAND METAL-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

4. Eject the alignment tape.

3. OXIDE Guard Band Width Check

1. Play back the alignment tape.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
2. Repeat the following steps (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)



Guard Band

3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing steps (1) through (5).
   Specification 1: Guard band width is below a half of video display screen's height.
   Specification 2: Width of C side > Width of Y side

If the specification 1 or 2 is not satisfied (OXIDE)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
   Subtract 1 from each data of "GUARD BAND OXIDE-Y" and "GUARD BAND OXIDE-C" in A35 : DM VR 4.
   When the specification 2 is not satisfied:
   Add 1 to the data of "GUARD BAND OXIDE-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

4. Eject the alignment tape.

4. Data Save (Store the Adjusted Data)

1. To operate the maintenance mode, press the MENU button once.
2. To exit A35 : DM VR 4, press the MENU button once.

When the data is not changed only, skip over to step 5.

3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
4. To exit A3F : NV-RAM CONTROL, press the MENU button once.

5. To exit the maintenance mode, press the MENU button three times.

2-10-19. Component Output Level Adjustment

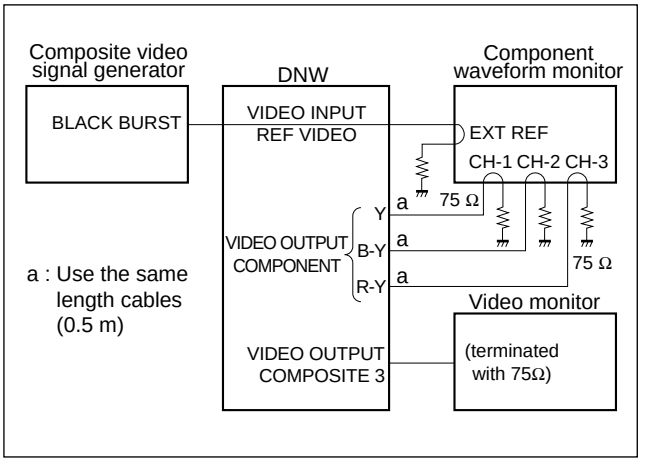
Preparing tools

- Analog composite video signal generator
  For DNW-A75:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A75P:
  TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the DM-89 and TBC-23A boards.

Reset the switch settings on the DM-89 and TBC-23A boards to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the settings on the sub control panel.

OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

KEY INHIBIT switch ⇨ OFF

5. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

6. Connect the equipment.

(Refer to Figure "Connection".)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

8. Stop the extending of the board.

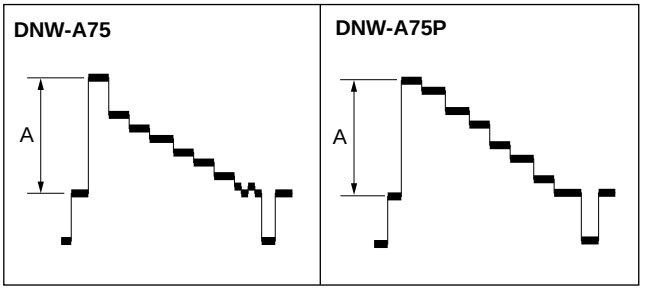
Do not use the extension board in this adjustment.

Note

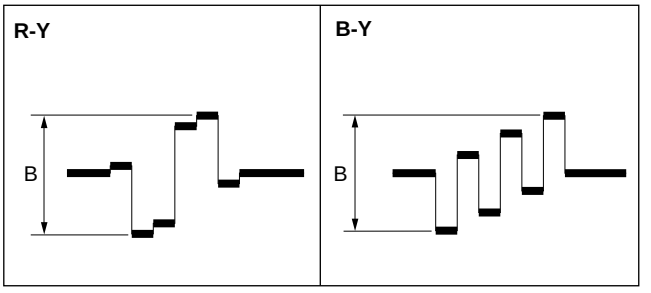
Before removing board, turn off the power.

1. METAL Y/C Check

1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
   If the specification is not satisfied, adjust it.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV101/TBC-24(F-1)
   Specification: DNW-A75: A = 714 ±7 mV (100 ±1 IRE)
   DNW-A75P: A = 700 ±7 mV



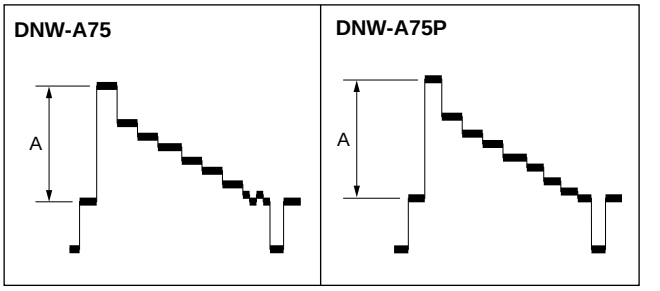
2. During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
   If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
   PB portion: The same as step 1
   Adj. point: ◓RV201/TBC-24(A/B-1)
   Specification: B = 700 ±7 mV



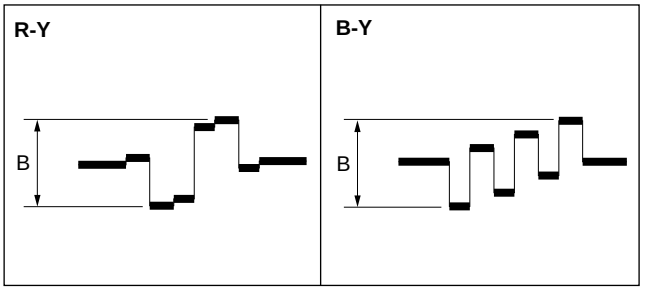
3. Eject the alignment tape.

2. OXIDE Y/C Check

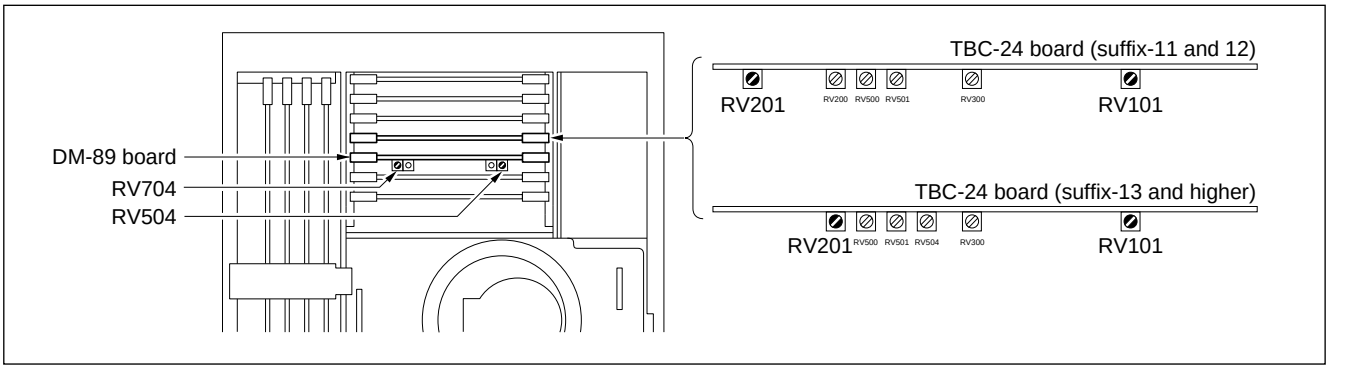
1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
   If the specification is not satisfied, adjust it.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ◓RV504/DM-89(F-1)
   Specification: DNW-A75: A = 714 ±7 mV (100 ±1 IRE)
   DNW-A75P: A = 700 ±7 mV



2. For DNW-A75P only:
   During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
   If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A PS
   Adj. point: ◓RV704/DM-89(B-1)
   Specification: B = 525 ±5 mV



3. Eject the alignment tape.



RV504 and RV704 on DM-89 Board, and RV101 and RV201 on TBC-24 Board

2-10-20. A/D Clamp DC Level Adjustment

Note

The A/D clamp DC level adjustment is for the TBC-24 board of the board number suffix -11 or -12.
In the other suffixes, this adjustment is not necessary.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the POWER switch.

2. Check the settings on the upper control panel.

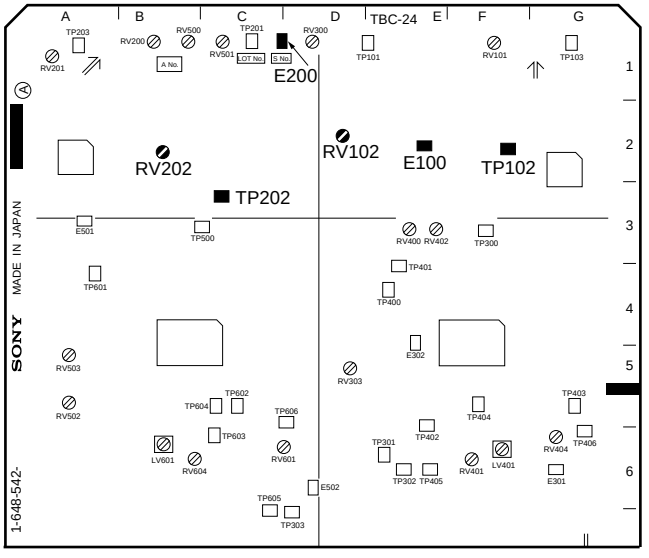
REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



TBC-24 Board (Side A) (Suffix-11 and-12)

Measurement / Adjustment

1. If the alignment tape is inserted, eject it.
2. Connect and set the oscilloscope as follows:
   CH-1: TP202/TBC-24(C-3), 500 mV/DIV
   GND: E200/TBC-24(C-1)
   CH-2: TP102/TBC-24(F-2), 500 mV/DIV
   GND: E100/TBC-24(E-2)
   TIME: 10 µs
3. Set each GND level of the oscilloscope's CH-1 and CH-2 to the oscilloscope's scale.
4. Set the oscilloscope to CH-1 display mode.
5. Turn off the power of VTR, than wait for more than 1 minute.
6. Just after turning on the power, measure the DC level of CH-1 (TP202) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for C)
7. Turn the oscilloscope to CH-2 display mode.
8. Turn off the power of VTR, than wait for more than 1 minute.
9. Just after turning on the power, measure the DC level of CH-2 (TP102) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for Y)

Measurement point	Measured DC level (fill up)	Note
CH-1: TP202/TBC-24(C-3)	A = _____	C
CH-2: TP102/TBC-24(F-2)	B = _____	Y

10. Turn the oscilloscope to CH-1 display mode.
11. During play back the alignment tape in PLAY mode, adjust the DC level of CH-1 (TP202) on the oscilloscope. (Adjustment for C)
    PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
    Adj. point: ⊘RV202/TBC-24(B-2)
    Specification: Measured DC level = A (in step 6)
12. Turn the oscilloscope to CH-2 display mode.
13. During play back the alignment tape in PLAY mode, adjust the DC level of CH-2 (TP102) on the oscilloscope. (Adjustment for Y)
    PB portion: The same as step 11
    Adj. point: ⊘RV102/TBC-24(D-2)
    Specification: Measured DC level = B (in step 9)
14. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "2-10-21. VCO Lock-in Range Adjustment".

2-10-21. VCO Lock-in Range Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the POWER switch.

2. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

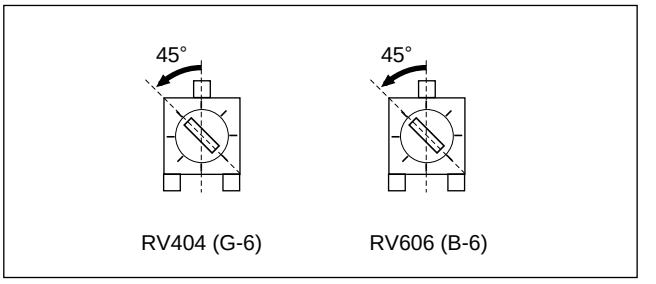
KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

Adjustment

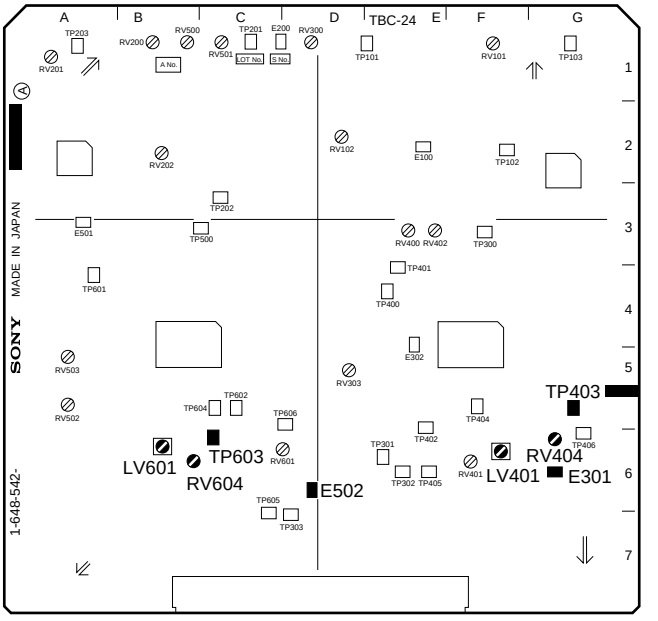
1. In the TBC-24 board of board number suffix -11 or -12, set the following RVs on the TBC-24 board to each specified position as shown figure below.



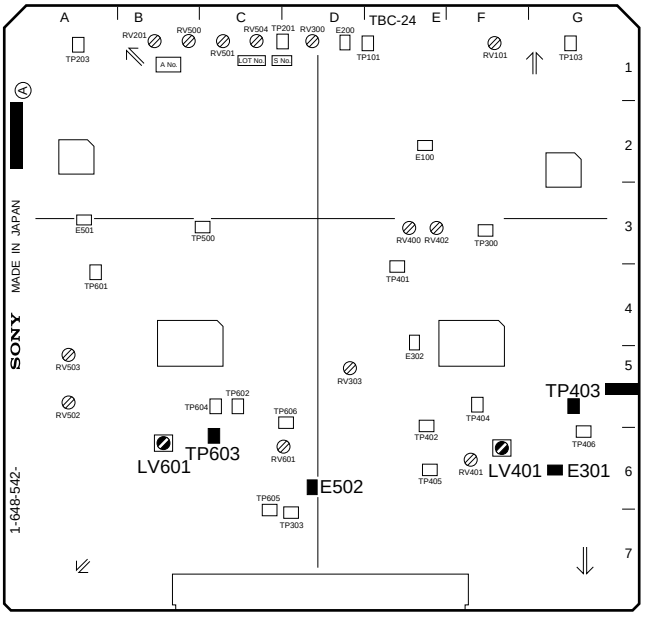
2. Connect and set the oscilloscope as follows:
   CH-1: TP403/TBC-24(G-5), DC 1 V/DIV
   GND: E301/TBC-24(G-6)
   CH-2: TP603/TBC-24(C-6), DC 1 V/DIV
   GND: E502/TBC-24(D-6)
3. During play back the alignment tape in PLAY mode, adjust each DC level of Y and C.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. points: Y (CH-1): ⊘LV401/TBC-24(F-6)
   C (CH-2): ⊘LV601/TBC-24(B-6)
   Specification: 2.0 ±0.2 V dc
4. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent “2-10-22. TBC VCO Free-running Adjustment”.



TBC-24 Board (Side A) (Suffix-11 and-12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

2-10-22. TBC VCO Free-running Adjustment

Note

If RV303 on the TBC-24 board is replaced or it is turned by mistake, be sure to perform this adjustment, Section 2-10-24, and later.

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
- Shorting clip

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the POWER switch.

2. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

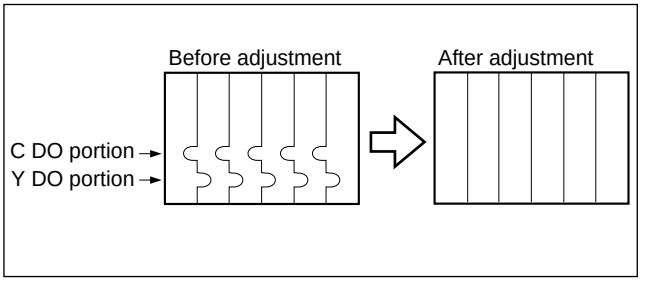
CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

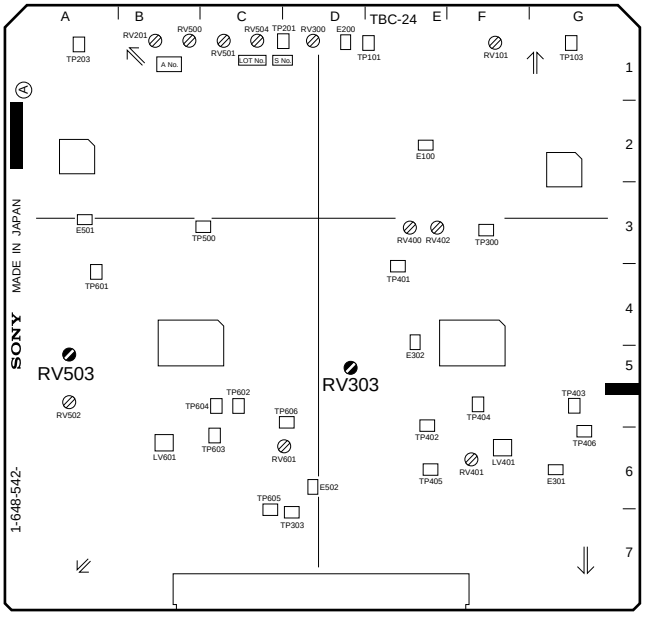
1. During play back the alignment tape in VARIABLE ×1 mode, check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out. If drop-out is appeared, adjust the following RVs.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
   Adj. points: Y DO: ⊘RV303/TBC-24(D-5)
   C DO: ⊘RV503/TBC-24(A-5)
   Specification: No dorp-out (on C DO and Y DO)



2. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent “2-10-23. FAST VCO Tracking Adjustment”.



TBC-24 Board (Side A)

2-10-23. FAST VCO Tracking Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)

  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

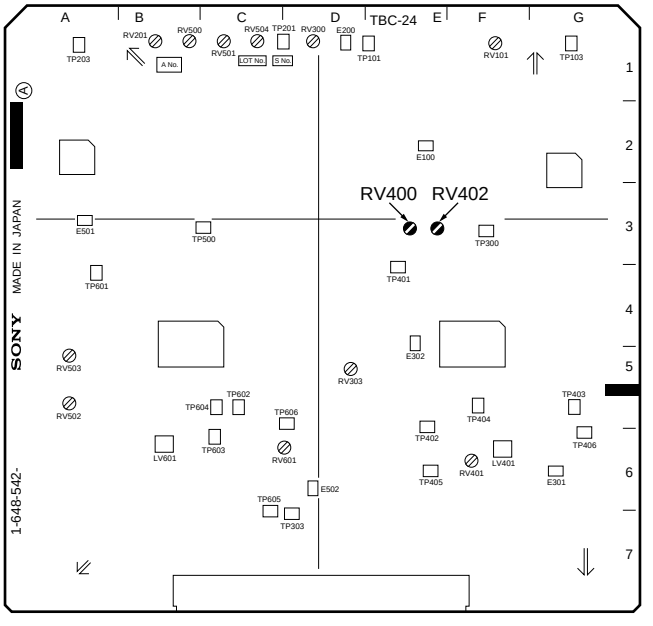
Before removing TBC-24 board, turn off the power.

2. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the settings on the sub control panel.

CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF



TBC-24 Board (Side A)

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

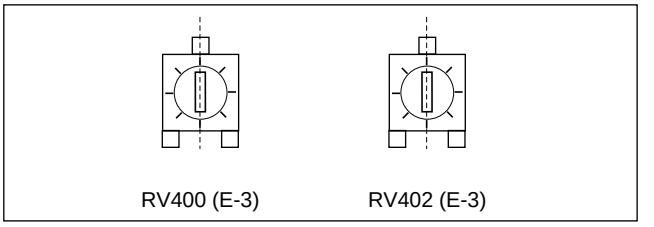
Adjustment

1. Set the following RVs on the TBC-24 board to each specified position as shown figure below.

   Note

   RV400 and RV402 are not equipped according to the model and the board number suffix of the TBC-24 board.

Suffix	RV400	RV402
11, 12, 13	With RV	With RV
14 and higher	Without RV	With RV for DNW-A75 Without RV for DNW-A75P



2. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
3. During play back the alignment tape in SHUTTLE −24 time speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
4. During play back the alignment tape in range from VARIABLE −10 time speed to fastest + speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
5. Eject the alignment tape.
6. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
7. Eject the alignment tape.

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2-10-24. PB Video Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

Note

It is required that the component video signal generator is able to output the 50% bowtie signal.

- Analog composite waveform/vector monitor:
  For DNW-A75: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A75P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (5 pieces)

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A Board.

Reset the switch settings on the TBC-23A board to the factory settings. (Refer to step 1 in "2-10-2. Common Preparation".)

3. Stop the extending of the board.

Do not use the extension board in this adjustment.

Note

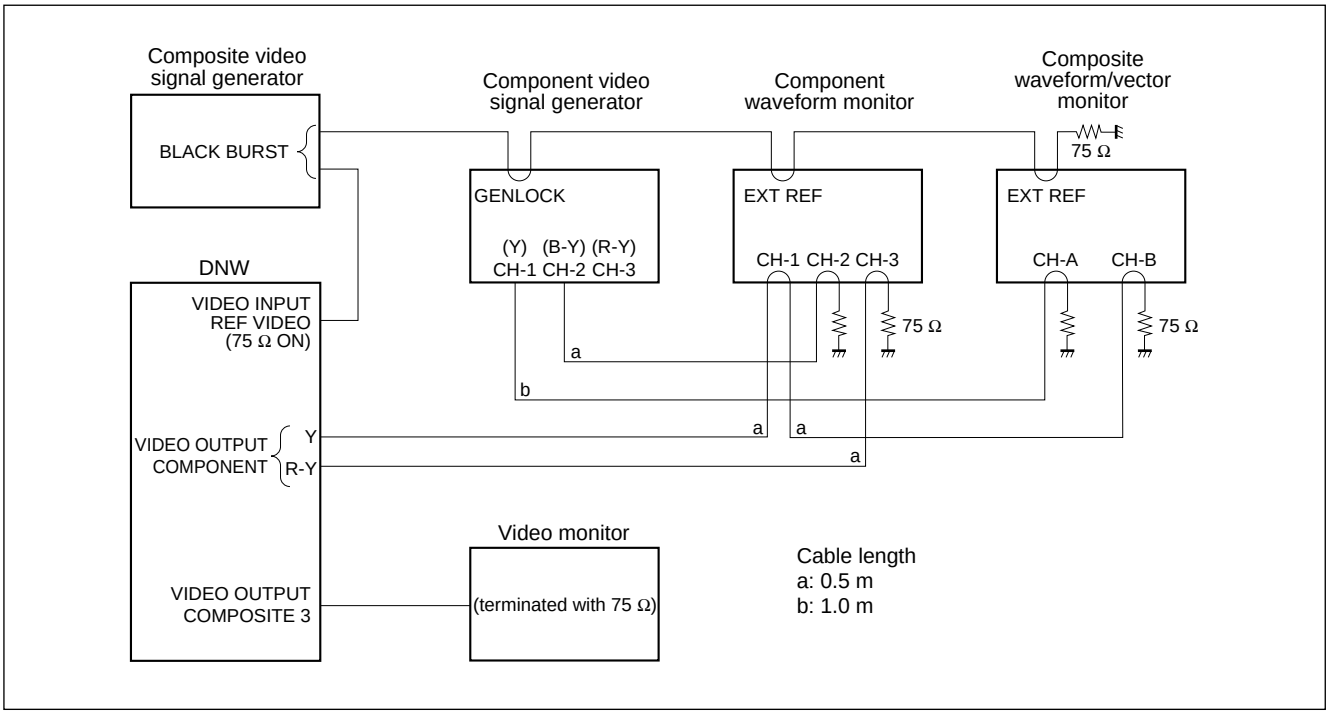
Before removing board, turn off the power.

4. Connect the equipment.

(Refer to Figure "Connection".)
Set a output of the analog component video signal generator to 50% bowtie signal.

5. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)



Connection

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP or BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

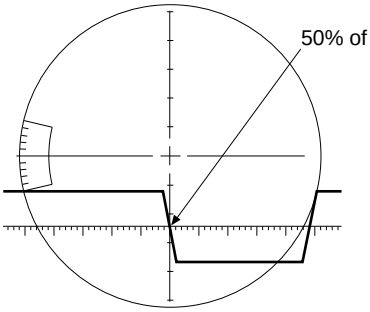
1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of "SQ Y RZ" is the following data value.
   DNW-A75: 4B, DNW-A75P: 4A
   If not, set it to above data.
4. To perform the tape operation, press the SET button once.

2. Set the System SYNC Position/Phase

1. Set the composite waveform/vector monitor as follows: WAVEFORM mode, SWEEP: 2H, MAG ON, INPUT: CH-A, EXT REF
2. Display the H SYNC part of CH-A on the composite waveform/vector monitor, and align 50% position at falling edge readability. (See Figure in step 4.)
3. Change the watching signal (channel) on composite waveform/vector monitor to CH-B.
4. During play back the alignment tape in PLAY mode, adjust the 50% position at falling edge of the H SYNC of CH-B to the identical position as CH-A using the SYNC control VR on the sub control panel.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS

Composite waveform/vector monitor (WAVEFORM mode)



5. Stop the playback of the alignment tape.
6. Set the composite waveform/vector monitor as follows: SCH mode, INPUT: CH-A, EXT REF
7. Align the SYNC phase of CH-A to 0 degree using the PHASE knob of the composite waveform/vector monitor. (See Figure in step 9.)

Note

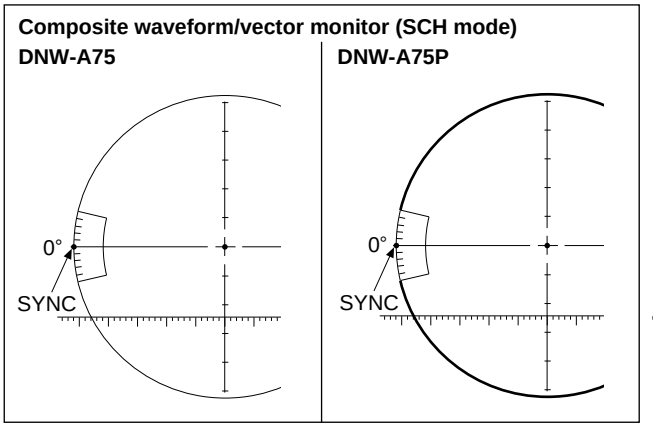
Turn the PHASE knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.

8. Change the watching signal (channel) on the composite waveform/vector monitor from CH-A to CH-B.
9. During play back the alignment tape in PLAY mode, adjust the SYNC (beam spot) of CH-B to 0 degree (the identical position as CH-A) using the SC control VR on the sub control panel.
   PB portion: The same as step 4

Note

Turn the SC control VR so that the beam spot (SYNC) moves in the shortest route to 0 degree.

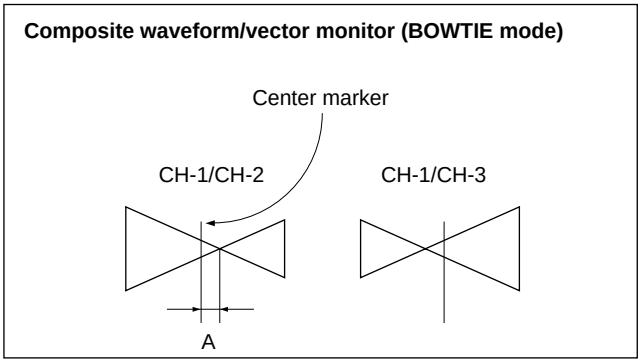
Composite waveform/vector monitor (SCH mode)



10. Stop the playback of the alignment tape.

3. Y Phase Adjustment

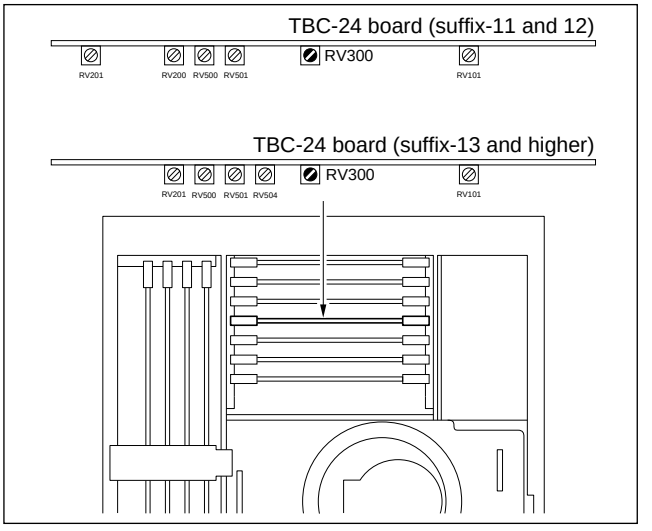
1. Set the component waveform monitor to BOWTIE mode.
2. During play back the alignment tape in PLAY mode, adjust the deviation between the center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y).
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV300/TBC-24 (D-1)
   Specification: A = 0 ±10 ns
   If the specification is not satisfied by adjustment, perform steps (1) through (5), before readjusting.



If the specification in step 2 is not satisfied only, perform the following steps (1) through (6).

(1) Set RV300 on the TBC-24 board to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item "SQ Y RZ" within +1 or −1 so that the bowtie dip point moves closer to the center marker.
   And make a note of the changed data value.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 2 again.

3. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent "2-10-25. TBC Y/C Delay Rough Adjustment".
4. To operate the maintenance mode, press the MENU button once.
5. To exit A37 : TBC VR, press the MENU button once.



RV300 on TBC-24 Board

Data save (Store the adjusted data)

When the data of “SQ Y RZ” in A37 : TBC VR was not changed, skip over to step 8.

6. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
7. To exit A3F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.

When the data of “SQ Y RZ” in A37 : TBC VR was changed in step (4), perform step 9 and later.

9. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And switch the video system of the video monitor.
10. To enter the maintemance mode, press S1101(L-1) on the SS-83 board.
11. Enter A37 : TBC VR.
12. Set the item “SQ Y RZ” to the data that is subtracted 1 from an noted letest date in step (4).
13. To exit A37 : TBC VR, press the MENU botton.
14. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
15. To exit the maintenance mode, press the MENU botton four times.
16. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the monitor.
    DNW-A75: 525/60 system (NTSC)
    DNW-A75P: 625/50 system (PAL)

2-10-25. TBC Y/C Delay Rough Adjustment

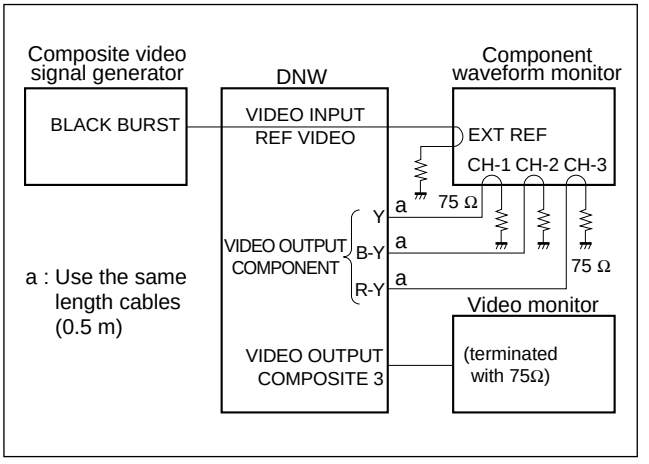
Preparing tools

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the power.

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

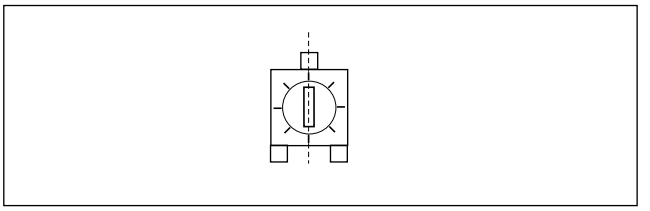
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of “SQ C RZ” is the following data value.
   (If not, set it to above data.)
   NTSC model: 6F, PAL model: 6E
4. To perform the tape operation, press the SET button once.

2. Adjustment

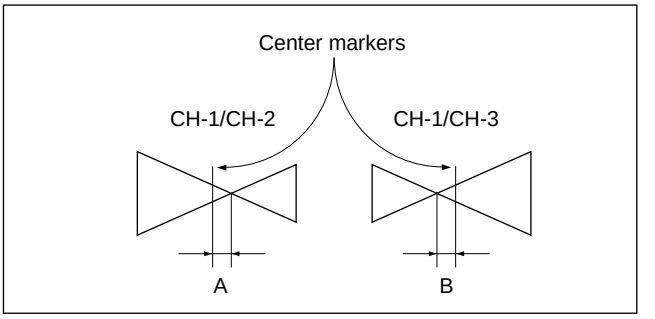
1. Set RV502/TBC-24(A-5) to the specified position as shown figure below.



2. Set the component waveform monitor to BOWTIE mode.
3. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
4. Adjust difference of deviations between each center marker and bowtie dip points of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ◓RV503/TBC-24(A-5)
   Specification: A − B = 0 ±10 ns
   (Refer to figure at step 5.)
5. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ◓RV500/TBC-24(B-1)
   Field 2: ◓RV504/TBC-24(C-1)
   Specifications: A = 0 ±10 ns, B = 0 ±10 ns
   If the specification is not satisfied by adjusting RV500, perform step (1) through (6).

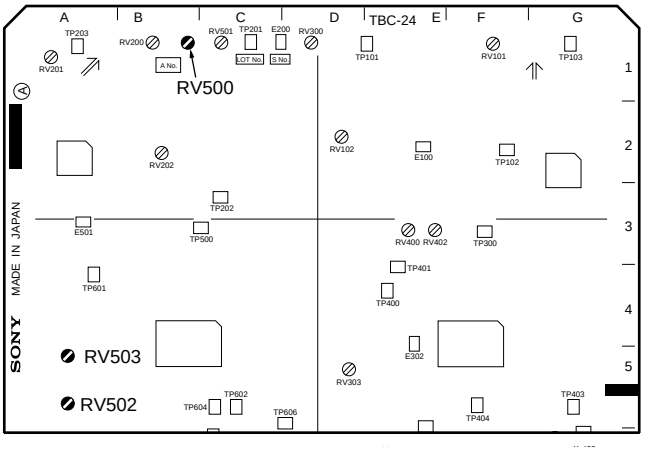
Note

As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.

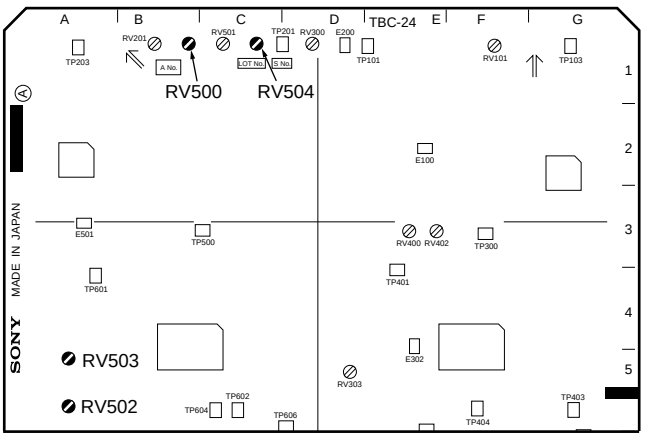


If the specification in step 5 is not satisfied only, perform following steps (1) through (6)

(1) Set RV500/TBC-24(B-1) to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 3
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item “SQ C RZ” within +2 or −2 so that the bowtie dip points move closer to center markers.
   And make a note of the changed data value.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 5 again.



TBC-24 Board (Side A) (Suffix-11 and -12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

6. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “2-10-26. Impact Error offset Alignment”.
7. To operate the maintenance mode, press the MENU button once.
8. To exit A37 : TBC VR, press the MENU button once.

Data save (Store the adjusted data)

When the data of “SQ C RZ” in A37 : TBC VR was not changed, skip over to step 11.

9. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note
   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A3F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

When the data of “SQ C RZ” in A37 : TBC VR was changed in step (4), perform step 12 and later.

12. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And switch the video system of the video monitor.
13. To enter the maintemance mode, press S1101(L-1) on the SS-83 board.
14. Enter A37 : TBC VR.
15. Set the item “SQ C RZ” to the data that is subtracted 1 from an noted letest date in step (4).
16. To exit A37 : TBC VR, press the MENU botton.
17. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
18. To exit the maintenance mode, press the MENU botton four times.
19. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the monitor.
    DNW-A75: 525/60 system (NTSC)
    DNW-A75P: 625/50 system (PAL)

2-10-26. Impact Error Offset Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape

  For DNW-A75: CR5-1B (Part No. 8-960-096-41)

  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing the TBC-24 board, turn off the power.

4. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

KEY INHIBIT switch ⇨ OFF

6. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM

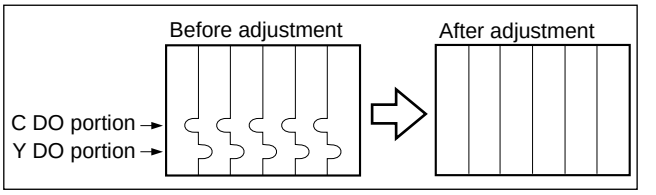
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

7. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

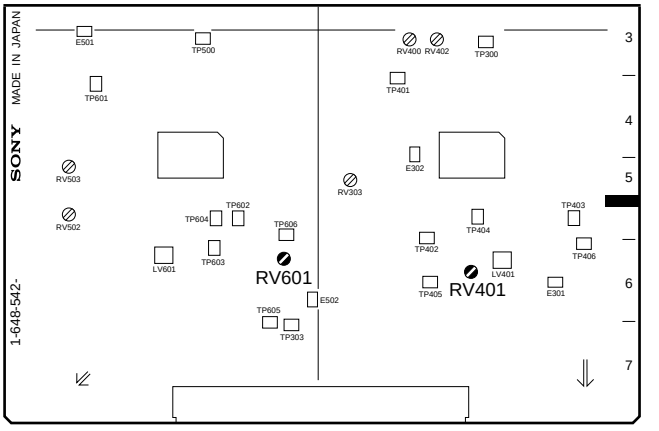
1. Start the playback of alignment tape in PLAY mode.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
2. Check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   Adj. points: Y DO: ⊘RV401/TBC-24(F-6)
   C DO: ⊘RV601/TBC-24(D-6)
   Specification: No dorp-out (on C DO and Y DO)



3. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent "2-10-27. TBC Y/C Delay Adjustment".



TBC-24 Board (Side A)

2-10-27. TBC Y/C Delay Adjustment

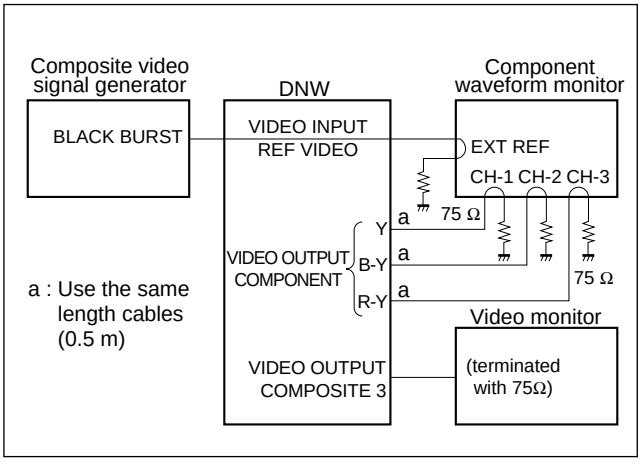
Preparing tools

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Stop the extending of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

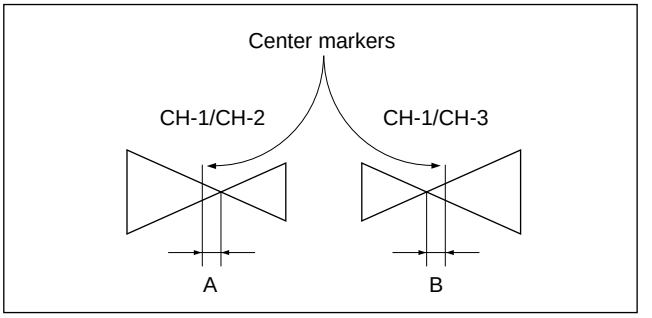
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. METAL Adjustment

1. Set the component waveform monitor to BOWTIE mode.
2. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
3. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns

Note

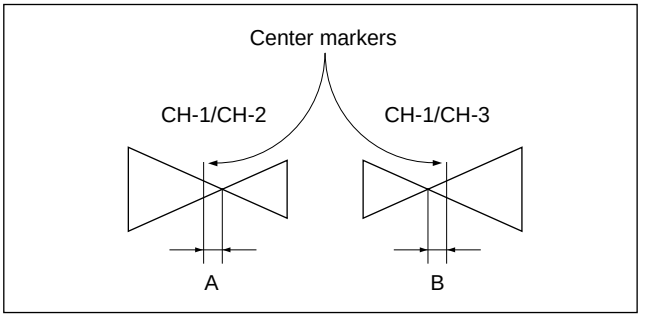
As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.



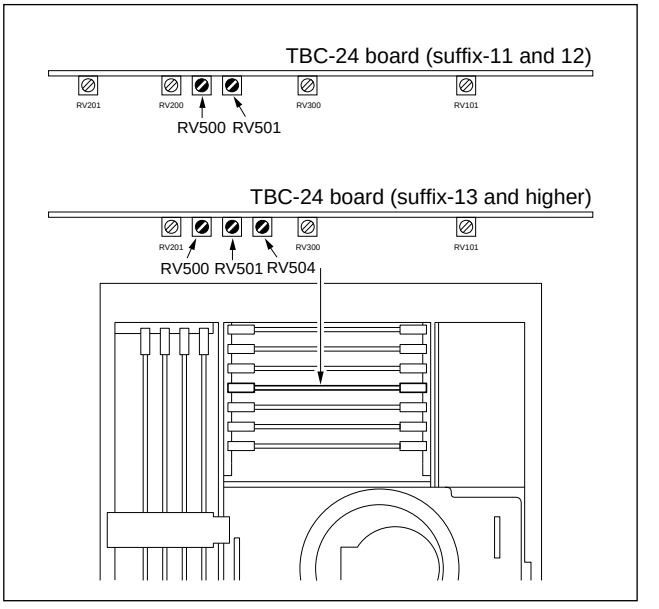
4. Eject the alignment tape.

2. OXIDE Adjustment

1. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (6:00 to 9:00) of CR5-2A / CR5-2A PS
2. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV501/TBC-24(C-1)
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns



3. Eject the alignment tape.



RV500, RV501, and RV504 on TBC-24 Board

http://getMANUAL.com

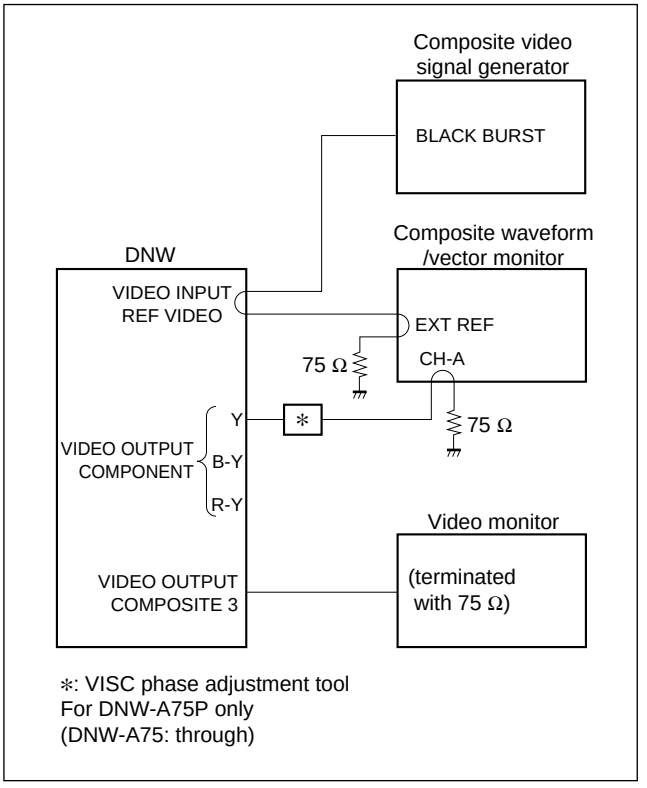
2-10-28. VISC Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog composite waveform/vector monitor:
  For DNW-A75: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A75P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes
  For DNW-A75: CR5-1B (Part No. 8-960-096-41)
  For DNW-A75P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Stop the extension of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

KEY INHIBIT switch ⇨ OFF
CAPSTAN LOCK switch ⇨ 2FD

7. Check the setup extend menu settings. (DNW-A75 only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101 (L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of “VISC PHASE” is the following data value.
   DNW-A75: 05, DNW-A75P: 03
   If not, set it to above data.
4. To perform the tape operation, press the SET button once.

2. Adjustment

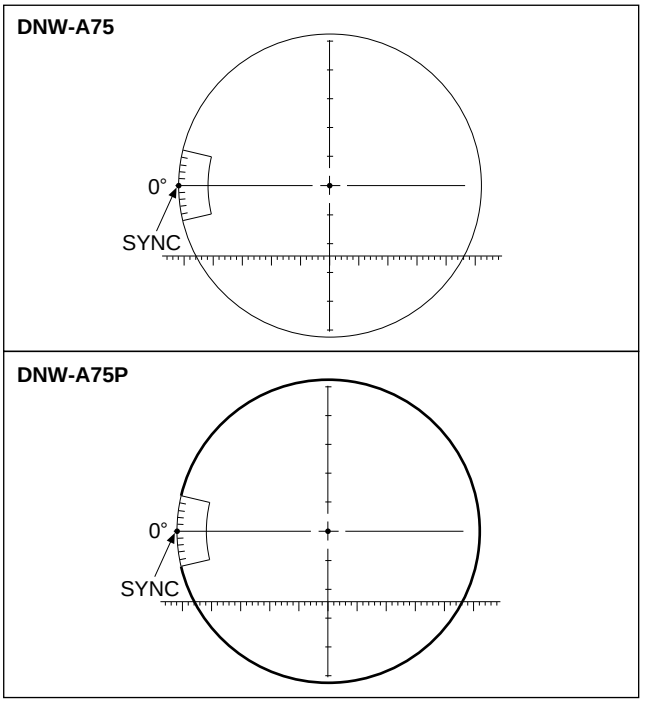
1. Set the composite waveform/vector monitor as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: H sweep signal with VISC signal (28:00 to 30:00) of CR5-1B / CR5-1B PS

   Note

   To confirm that the specifications are satisfied in step 8 within two minutes after starting the playback, be sure to complete the working in a short time.
   If the playback signal is changed another on steps to step 9, return to step 2 and restart.
3. Set the CAPSTAN LOCK switch on the sub control panel as follows, then return it to 2FD after 2 seconds.
   DNW-A75: 4FD, DNW-A75P: 8FD
4. Set the SYNC to 0 degree using PHASE control knob of the composite waveform/vector monitor.

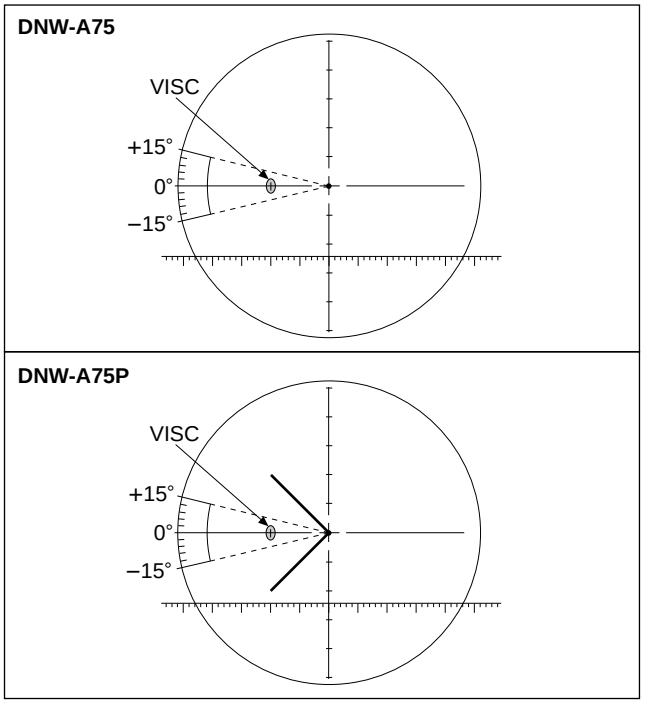
   Note

   Turn the PHASE control knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.



Composite waveform/vector monitor (SCH mode)

5. Set the composite waveform/vector monitor as follows:
   DNW-A75: VECTOR mode, Line select: 11, EXT REF
   DNW-A75P: VECTOR mode, Line select: 8, EXT REF
6. Align the center position of VISC (beam spot) to 0 degree with PHASE knob of the composite waveform/vector monitor.
   Note
   Turn the PHASE knob so that the beam spot (VISC) moves in the shortest route to the specified position.
7. Set the CAPSTAN LOCK switch on the sub control panel as follows:
   DNW-A75: 4FD, DNW-A75P: 8FD
8. Adjust the center position of VISC (beam spot).
   Adj. point: ⊘RV200/TBC-23A(C-1)
   Specifications: Center of beam spot: 0 ± 5°
   Jitters of beam spot: 0 ± 15°
   If the specification is not satisfied, readjust after performing steps (1) through (4) on next page.



Composite waveform/vector monitor (VECTOR mode)

If the specification in step 8 is not satisfied only, perform steps (1) through (5).

(1) Set RV200 on the TBC-23A board to the mechanical center.
(2) To operate the maintenance mode, press the MENU button once.
(3) Change the data value of item “VISC PHASE” within +1 or −1 so that the center of VISC (beam spot) moves closer to 0 degree.
(4) To perform the tape operation, press the SET button once.
(5) Perform step 8 again.

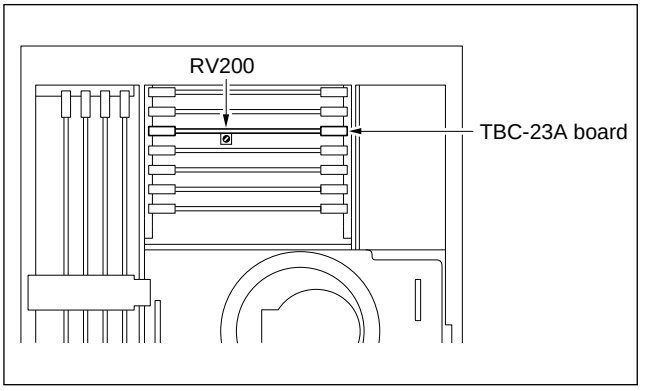
9. Stop the playback of the alignment tape, and eject it.
10. To operate the maintenance mode, press the MENU button once.
11. To exit A37 : TBC VR, press the MENU button once.

Data save (store the adjusted data)

When the data of “VISC PHASE” in A37 : TBC VR was not changed, skip over to step 14.

12. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.
    Note
    When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
13. To exit A3F : NV-RAM CONTROL, press the MENU button once.

14. To exit the maintenance mode, press the MENU button three times.



RV200 on TBC-23A Board

2-11. SDI/SDTI I/O Line Adjustment

2-11-1. Adjustment Overview

In the electrical adjustments for the SDI/SDTI input/output, adjust each VCO free-running frequency for the decoders and encoders using the menu in the maintenance mode.
Usually perform the automatic adjustment of Section 2-11-2. If the manually adjustment is needed, refer to Section 2-11-3.

Notes

- For the DNW-A75/75P is applied the SDTI input/output function by the following optional kits.
  SDTI input : BKNW-117
  SDTI output : BKNW-118
- For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

Tools list

To perform the electrical adjustments for the SDI/SDTI input/output lines, prepare the following equipment.

Note

Manually adjustment is not needed when the automatic adjustment can be is performed in the VTR.

When performing the automatic adjustment

- Analog composite video monitor

When performing the manually adjustment

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Since above adjustment items can be adjusted independently of each other, no special order has been observed.

Line	Item	Adjustment point	Measurement point for manually adj.
SDI outputs	Encoder1 VCO free-running freq. adj.	A231 : SDI ENC1 VCO	TP201/SDI-41
	Encoder2 VCO free-running freq. adj.	A232 : SDI ENC2 VCO	TP201/SDI-41
SDI input	Decoder VCO free-running freq. adj.	A233 : SDI DEC VCO	TP201/SDI-41
SDTI output	Encoder VCO free-running freq. adj.	A234 : SDTI ENC VCO *1	TP1/DPR-119
SDTI input	Decoder VCO free-running freq. adj.	A234 : SDTI DEC VCO *2	TP100/DPR-120
	Data save	A2F : NV-RAM CONTROL	

∗1 : This is displayed when the DPR-119 board is installed.
For the optional kit BKNW-118 (DPR-119 board)
∗2 : This is displayed when the DPR-120 board is installed.
For the optional kit BKNW-117 (DPR-120 board)

2-11-2. VCO Free-running Frequency Automatic Adjustment

Preparing tool

- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

2. Check that the VTR has warmed up.
Before starting the adjustment, warm up the VTR through the power for 10 minutes or more.

Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A23 : CP VR in the maintenance mode.
3. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDI input: A233 : SDI DEC VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)
   SDTI input: A235 : SDTI DEC VR (for BKNW-117)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
4. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button. (In the time data display area, "PUSH SET" is displayed.)
5. To execute the automatic adjustment, press the SET button once.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
6. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

   Note

   If message "Auto Adjust Failure" is displayed, refer to the "For Automatic Adjustment Failure" below.
7. To exit the sub menu, press the MENU button once.

   Note

   Go to step 3 in order to perform other VCO free-running frequency adjustment.
8. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

9. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

For Automatic Adjustment Failure

In the sub menu A231, A232, or A233

Confirm that no abnormality exists in the cable connecting the SDI connectors on the SDI-41 board and rear panel.
If no abnormality is found in the connection, the SDI-41 board is considered to be defective.

In the sub menu A234

Confirm that no abnormality exists in the cable connecting the SDTI output connectors on the DPR-119 board and rear panel.
If no abnormality is found in the connection, the DPR-119 board is considered to be defective.

In the sub menu A235

Confirm that no abnormality exists in the cable connecting the SDTI input connectors on the DPR-120 board and rear panel.
If no abnormality is found in the connection, the DPR-120 board is considered to be defective.

2-11-3. VCO Free-running Frequency Manually Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Extend the DPR-118 board with an extension board EX-555.

Note

Before removing DPR-118 board, turn off the power.

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 10 minutes or more.

Manual Adjustment

1. Set the oscilloscope as follows:
   CH-2: DC 2 V/DIV
   TIME: 100 µs/DIV
2. Connect the frequency counter's input to the oscilloscope's CH-2 output.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A23 : CP VR of the maintenance mode.
5. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDI input: A233 : SDI DEC VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)
   SDTI input: A235 : SDTI DEC VR (for BKNW-117)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
6. Turn the search dial in FORWARD (↻) direction to move the ∗-mark to the line of the adjustment data . (Displays the item title in the time data display area, "SDI ENC1" for example.)
7. Connect the osilloscope's CH-2 input as follows:

For SDI	TP201/SDI-41 (E-1) GND : E6/SDI-41 (B-1)
For SDTI output	TP1/DPR-119 (A-3 of side B) GND : E1/DPR-119 (C-4 of side B)
For SDTI input	TP100/DPR-120 (E-2 of side B) GND : E100/DPR-120 (E-1 of side B)

8. Change the data until the indicated frequency on the frequency counter satisfy the specification .
   Specification: 27.00 ±0.10 MHz

   Note

   How to change the adjustment data:
   Turn the search dial while pressing the JOG button.
9. To exit the sub menu, press the MENU button once.

   Note

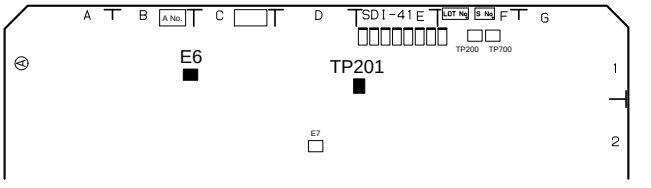
   Go to step 5 in order to perform other VCO free-running frequency adjustment.
10. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

11. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
12. To exit the maintenance mode, press the MENU button four times.



SDI-41 Board (Side A)

2-12. TBC Remote Control Offset Adjustment (FP-117 Board)

When the CAV control level conversion circuit (about IC7 to IC10) on the FP-117 board was repaired, perform this adjustment.

Note

Before attaching the panel of the upper control panel, perform this adjustment.

Tools

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Something to short-circuit the D-SUB connector's pins

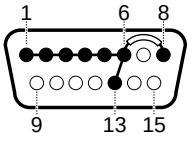
  Note

  There is a convenient with the shorting connector as follows:

  Used component:

  D-SUB connector (female) (Part No. 1-561-610-21)

Short the pins through 6, 8, and 13 of the connector.



Note: Be sure to connect the pin 8 with the covered wire.

Shorting Connector

Preparation

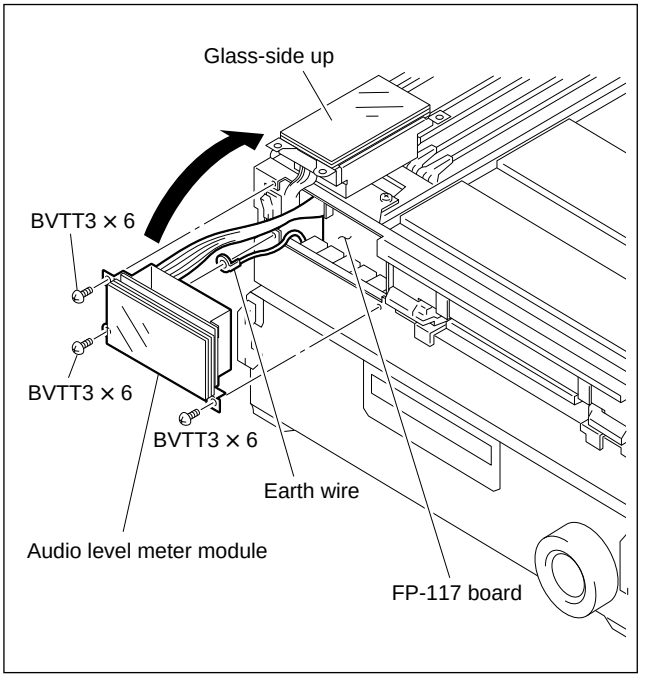
1. If the upper control panel was reattached, remove it. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Unscrew the three screws and remove the audio level meter module.

   Note

   There is glass part in the module. Be sure to handle with care.
3. Disconnect the harness from the audio level meter module.

   Note

   Be sure place the audio level meter module on the its glass-side up.



Removing of Audio Level Meter Module

4. Connect the power cord. (POWER switch is OFF.)
5. Turn on the power and warm up the VTR and digital voltmeter through the power for 20 minutes or more.

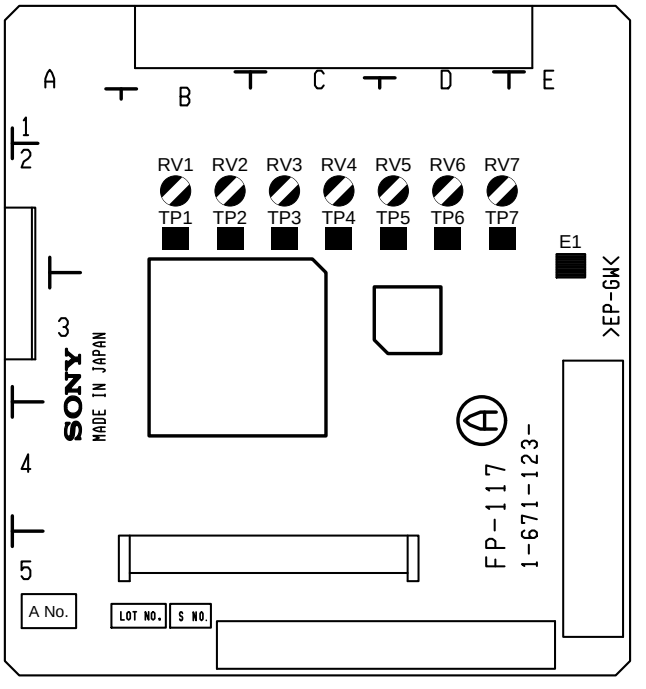
Adjustment without the Shorting Connector

Note

Be sure to short-circuit VIDEO CONTROL connector's pins in the power off.
Never short-circuit this connector's pin 7 (+12 V) or pin 15 (−12 V) to other pin.

1. Turn off the power.
2. Short-circuit VIDEO CONTROL connector's pin 8 (GND) to one of the satisfied pin on the table below.
3. Turn on the power.
4. Connect the digital voltmeter to the specified measurement point on the table below.
5. Adjust the voltage on the digital voltmeter.
   Adj. points: Refer to table below.
   Specification: 2.500 ±0.001 V dc
6. Repeat from step 1 util completing the adjustments for all adjustment points.

Pin No. to short-circuit [Adjusting item]	Measurement point	Adjustment point
1 [SYNC PHASE]	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
2 [CHROMA PHASE]	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
3 [SC PHASE]	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)
4 [VIDEO LEVEL]	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
5 [SETUP(BLACK) LEVEL]	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
6 [CHRAMA LEVEL]	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
13 [Y/C DELAY]	TP4/FP-117(C-2)	⊘RV4/FP-117(D-2)



FP-117 Board (Side A)

Adjustment with the Shorting Connector

Note

Be sure to connect the shorting connector in the power off.

1. Turn off the power.
2. Connect the shorting connector to VIDEO CONTROL connector.
3. Turn on the power.
4. Adjust each voltage on the digital voltmeter.
   Measure. point: Refer to the table below.
   Adj. point: Refer to the table below.
   Specification: 2.500 ±0.001 V dc

Adjusting item	Measurement point	Adjustment point
VIDEO LEVEL	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
CHRAMA LEVEL	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
SETUP(BLACK) LEVEL	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
Y/C DELAY	TP4/FP-117(C-2)	⊘RV4/FP-117(D-2)
CHROMA PHASE	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
SYNC PHASE	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
SC PHASE	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)

Perfection

1. Turn off the power.
2. Reinstall the audio level meter module.
   (Perform in the reverse steps 2 and 3 of "Preparation".)
   Notes
   - This module's displaying side is glass. Be sure to handle with care.
   - Fix the earth wire and this module (its left part) together .
3. Reattach the panel for the upper control panel.
4. When the shorting connector was used, remove it.

2-13. LTC Alignment and Full Erasure Current Check (TC-102 Board)

2-13-1. Adjustment Overview

When the TC-102 board is repaired or replaced, perform the time code system alignment.

Tools List

To perform the time code system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Alignment tape: SR5-1 (Part No. 8-960-075-01) or
  SR5-1P (Part No. 8-960-075-51)

Note

Prepare either SR5-1 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the video system to be adjusted.

- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title)	Adjustment point	Measurement point
2-13-2	LTC playback level check	—	TP102/TC-102(A-2)
2-13-3	LTC recording level check	—	TP100/TC-102(A-3), TP101/TC-102(A-2)
2-13-4	Full erasure current check	—	TP201/TC-102(B-1), TP200/TC-102(B-1)
2-13-5	LTC erasure current adjustment	⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)

Common Preparation

Perform the settings of control panels' switch, before starting the adjustments.
Return the all settings to the customer settings after completing the alignment.

Part	Item		Customer setting	Setting at adjustment
Upper control panel	TC:	LTC/AUTO/VISC	_____	⇨ LTC
	TC GENERATOR:	INT/EXT	_____	⇨ INT
		PRESET/REGEN	_____	⇨ REGEN
		REC RUN/REC RUN	_____	⇨ REC RUN
	REMOTE:	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	REC INHIBIT switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

2-13-2. LTC Playback Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Alignment tape: SR5-1 (Part No. 9-960-075-01) or SR5-1P (Part No. 9-960-075-51)

Note

Prepare either SR5-2 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the video system to be adjusted.

Preparation

1. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the setting on the sub control panel.

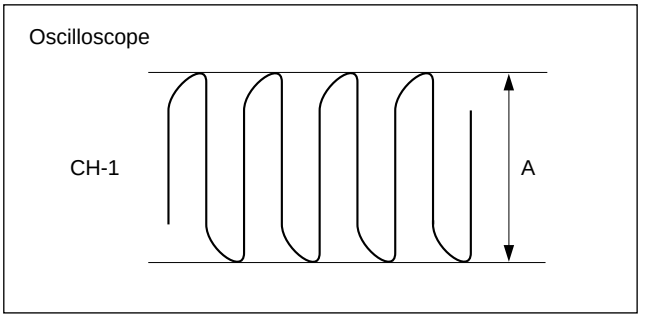
KEY INHIBIT switch ⇨ OFF

3. Check that the equipment has warmed up.

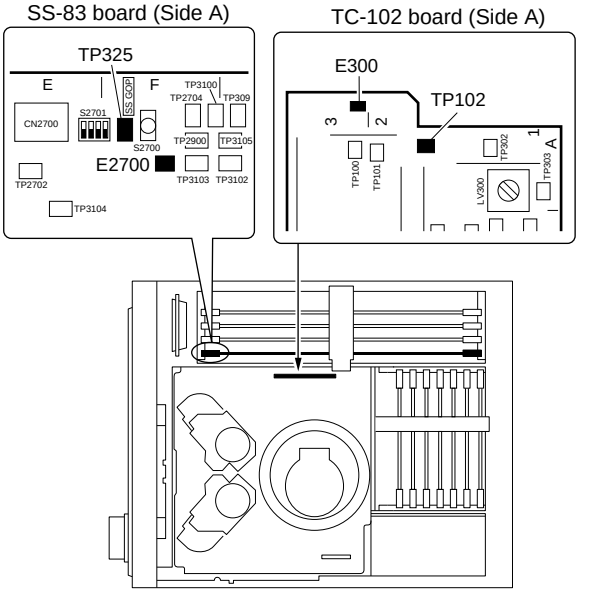
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Playback Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP102/TC-102(A-2), DC 100 mV/DIV
   GND: E300/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in the following PB modes, check each level on the oscilloscope.
   PB modes: PLAY
   REW
   SHUTTLE (−5 times speed)
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)



4. Eject the alignment tape.



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2-13-3. LTC Recording Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Check the settings on the upper control panel.

LTC/AUTO/VISC		⇨ LTC
INT/EXT		⇨ INT
PRESET/REGEN		⇨ REGEN
FREE RUN/REC RUN		⇨ REC RUN
REMOTE :	9P	⇨ Off (Light off)
	50P	⇨ Off (Light off)

2. Check the settings on the sub control panel.

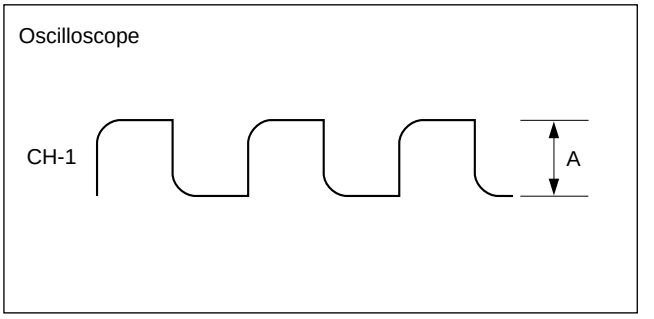
KEY INHIBIT switch	⇨ OFF
REC INHIBIT switch	⇨ OFF

3. Check that the equipment has warmed up.

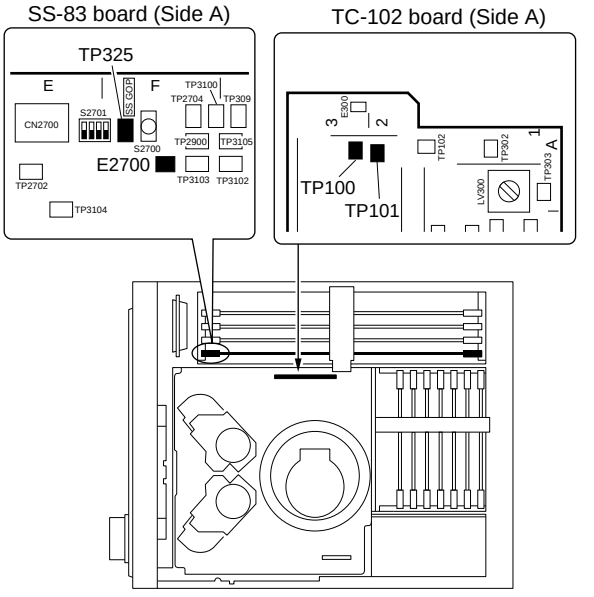
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Recording Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP100/TC-102(A-2), DC 100 mV/DIV
   GND: TP101/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the recording tape.
3. Check the level on the oscilloscope in recording on the tape.
   Specification: A = 60 ±5 mV p-p



4. Eject the recording tape.



2-13-4. Full Erasure Current Check

Preparing tools

- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advence.

Preparation

1. Check the settings on the upper control panel.

REMOTE : 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the settings on the sub control panel.

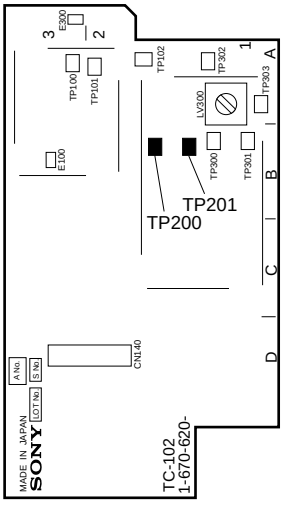
KEY INHIBIT switch ⇨ OFF
REC INHIBIT switch ⇨ OFF

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio level meter through the power for 10 minutes or more.

Full Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP201(B-1) on the TC-102 board.
   GND: TP200/TC-102(B-3)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Specification: 120 mV rms or more
   (Note: 40.5 ±1.0 kHz)



TC-102 Board (Side A)

2-13-5. LTC Erasure Current Check

Preparing tools

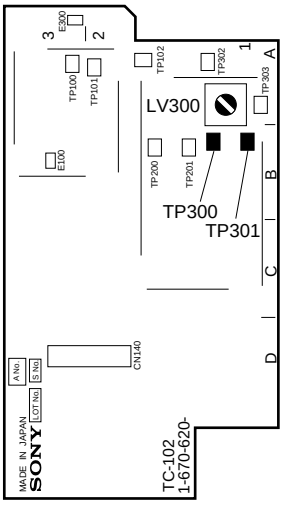
The same as Section 2-13-4

Preparation

The same as Section 2-13-4

Time Code Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP301(B-1) on the TC-102 board.
   GND: TP300/TC-102(B-1)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Adj. point: ⊘LV300/TC-102(A-1)
   Specification: Maximum (110 mV rms or more: OK)
   (Note: 40.5 ±1.0 kHz)



TC-102 Board (Side A)

Section 3
Replacement of Main Parts

This section explains the replacement procedures of periodic replacement parts, main mechanical parts, power supply unit, and circuit boards.

3-1. General Information for Parts Replacement

3-1-1. Index

The parts that are explained the replacement procedures in this section are as shown in the tables below.

(1) Mechanical parts and power supply unit

Items		Page
3-2.	Upper Drum Assembly Replacement	3-8
3-3.	Drum Assembly Replacement	3-17
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3-10.	Pinch Roller Replacement	3-50
3-11.	Pinch Solenoid Replacement	3-53
3-12.	Capstan Motor Replacement	3-63
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3-17.	Reel Shift Gear Replacement	3-111
3-18.	Reel Shift Motor Replacement	3-116
3-19.	Tape Guide Replacement	3-121
3-20.	Tape Cleaner Replacement	3-122
3-21.	Gear Box Assembly and Threading Motor Replacement	3-124
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3-23.	S-tension Regulator Assembly Replacement	3-150
3-24.	T-tension Arm Replacement	3-152
3-25.	T Drawer Arm Replacement	3-156
3-26.	Cassette Compartment Motor Replacement	3-166
3-27.	Mechanical Adjustment Table	3-170
3-28.	Fan Motor Replacement	3-172
3-29.	Power Supply Unit Replacement	3-179
3-31.	Board Replacement in Power Supply Unit	3-211

(2) Mounted Circuit Boards

Board name	Procedure
AC-169	Refer to the exploded views.
APR-40	Plug-in board
AU-260	Plug-in board
CCM-15	Refer to “Gear Box Assembly and Threading Motor Replacement (Section 3-21)” or “Reel Shift Motor Replacement (Section 3-18)”. It is not neccessary to remove the moter and M gear.
CL-29	Refer to the exploded views.
CP-278	Section 3-30-1 .
CP-301	Section 3-30-2.
CP-334	Section 3-30-3.
CP-335	Section 3-30-4.
DEC-110	Plug-in board
DM-89	Plug-in board
DPR-118	Plug-in board
DR-315	Section 3-30-6.
DT-34D	Section 3-30-5.
EQ-75	Plug-in board
FP-117	Section 3-30-7.
KY-438	Section 3-30-8.
LP-81	Refer to the exploded views.
MB-818	Section 3-30-9.
MS-58	Section 3-30-10.
PC-70	Refer to the exploded views.
PD-35	Refer to “3-11. Pinch Solenoid Replacement”.
PTC-54	Refer to “3-21. Gear Box Assembly and Threading Moter Replacement”.
PTC-59	Refer to the exploded views. Replace by the MC sensor assembly (A-8278-312-A).
PTC-69	Refer to the exploded views. After replacement, perform the electrical adjustment (Section 2-3) before install the search dial assembly on the lower control panel.
PTC-71	Refer to the exploded views.
RM-130	Section 3-30-11.
RM-179	Section 3-30-11.
RM-181/82	Refer to “3-15. Reel Motor Assembly Replacement”.
SDI-41	Plug-in board
SE-344	Refer to the exploded views. Replace by the reel FG assembly (A-8278-310-A). After replacement, perform the reel table rotation sensor position adjustment (Section 3-15-7).
SE-461	Section 3-30-12.
SS-83	Plug-in board
SWC-31	Section 3-30-13.
SWC-35	Section 3-30-14.
TBC-23A	Plug-in board
TBC-24	Plug-in board
TC-102	Section 3-30-15.
TR-78	Replace by the tension regulator assembly (A-8267-795-E). (Refer to Section 3-23.)
TR-79	Section 3-30-16.
VPR-47	Plug-in board
VR-223	Section 3-30-17.
VR-224	Section 3-30-18.

- Refer to Section 2 of the maintenance manual part 1 for plug-in board replacement.
- Refer to Section 2 of the maintenance manual part 2 vol. 2 for the exploded views.

3-1-2. Threading End Mode and Unthreading End Mode

1. Threading End Mode

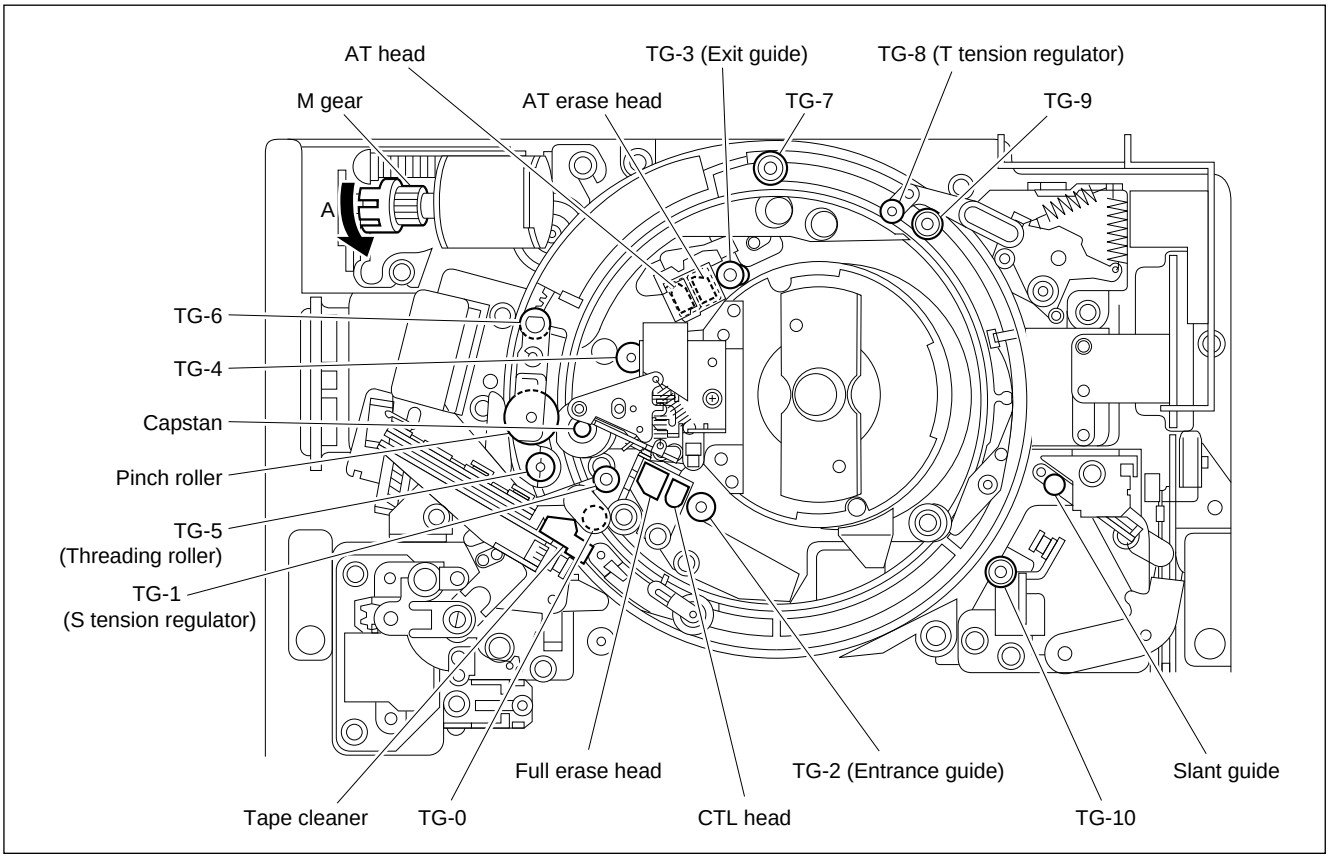
Threading end mode means that the threading ring rotates in the counterclockwise direction, then stops.

There are three ways of putting the unit into the threading end mode without installing the cassette compartment.

Method ①: Turn the power on.

Method ②: Press the STOP button under power-on state.

Method ③: Turn the M gear of the gear box assembly in the direction of the arrow A.



Threading End Mode

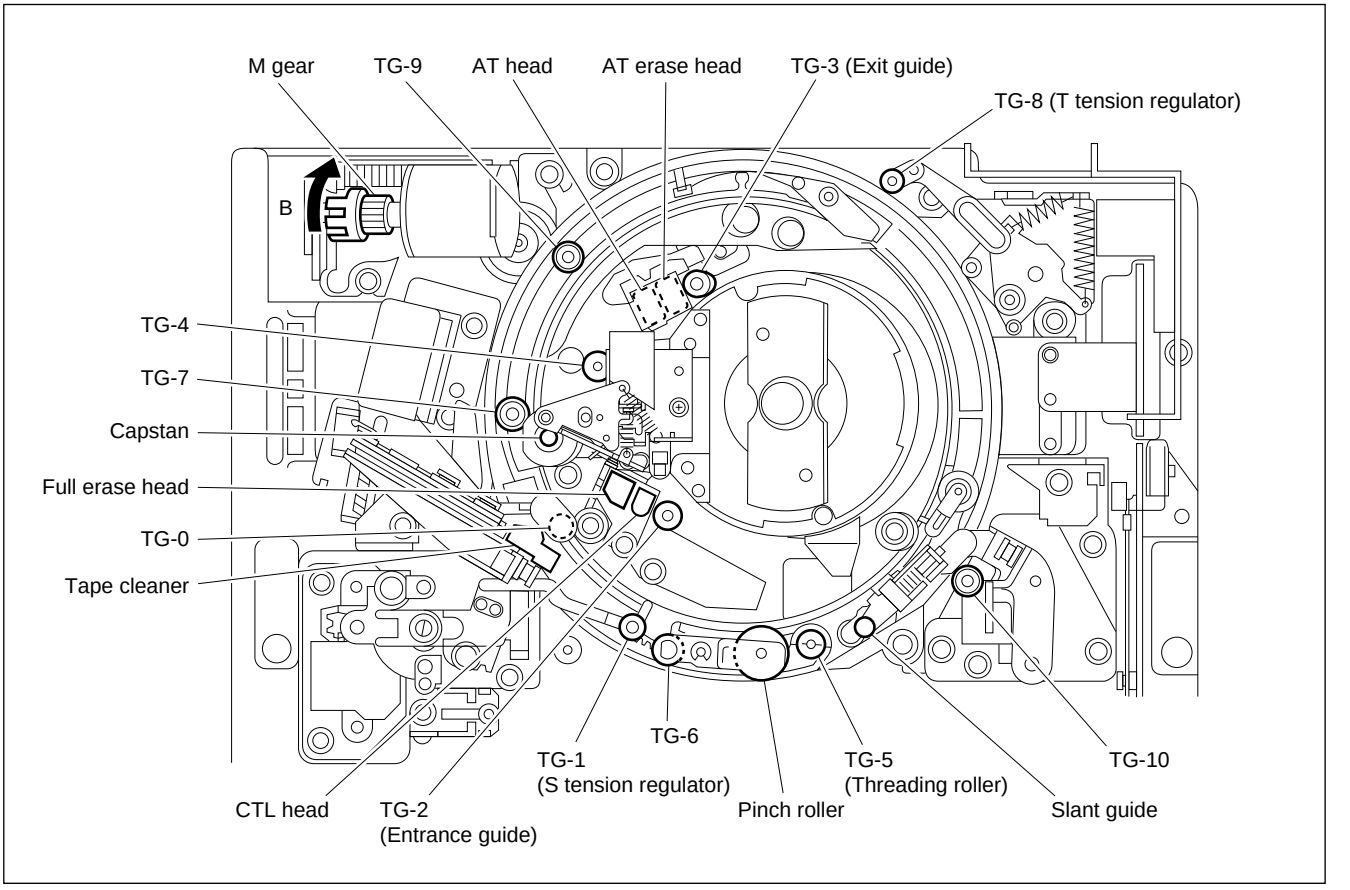
2. Unthreading End Mode

Unthreading end mode means that the threading ring rotates in the clockwise direction, then stops. (It is same state with EJECT completion mode.)

There are two ways of putting the unit into the unthreading end mode without installing the cassette compartment.

Method ①: Press the EJECT button under threading end mode.

Method ②: Turn the M gear of the gear box assembly in the direction of the arrow B.



Unthreading End Mode

3-1-3. L Cassette Position and S Cassette Position

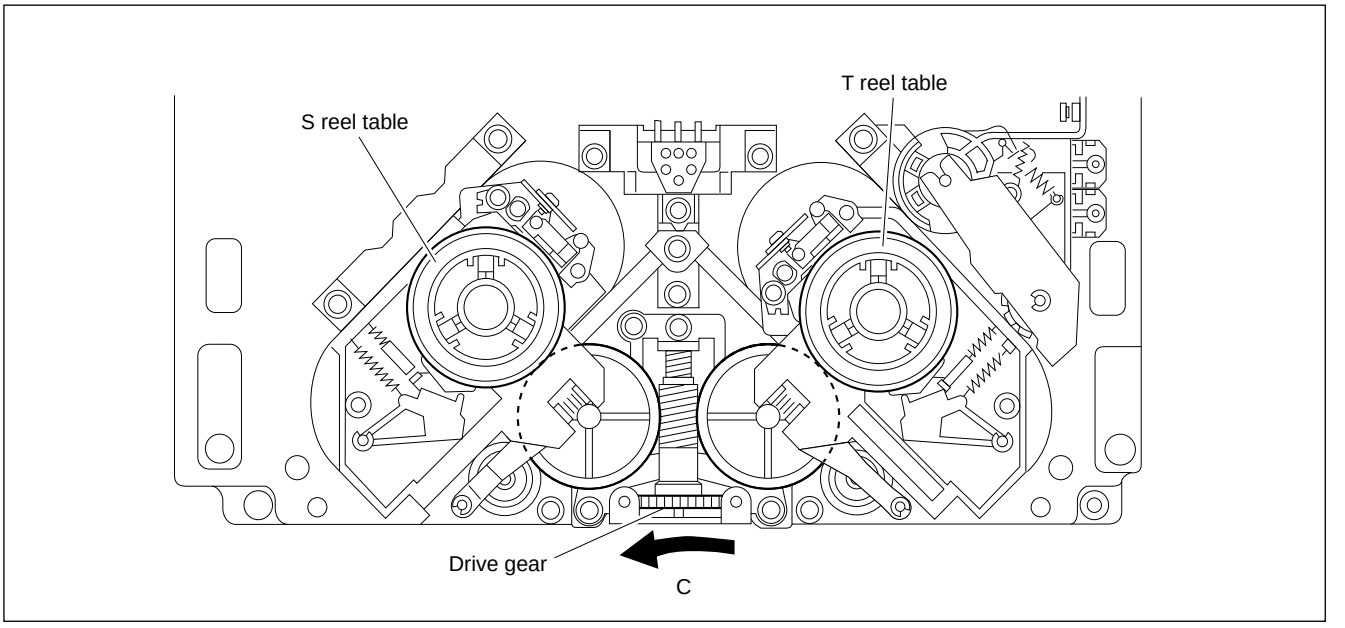
1. L Cassette Position

L cassette position means that the reel tables are in the position of L cassette tape.

There are two ways of putting the reel tables into the L cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow C.



L Cassette Position

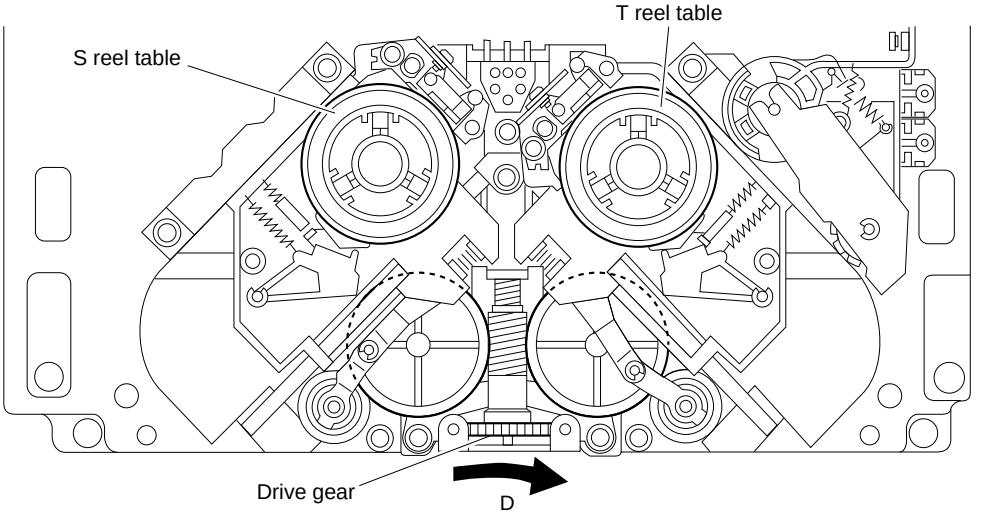
2. S Cassette Position

S cassette position means that the reel tables are in the position of S cassette tape.

There are two ways of putting the reel tables into the S cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow D.



S Cassette Position

3-1-4. Basic Knowledge

1. Tape Cleaner

WARNING

Never touch the edge of the tape cleaner with bare hands.
It is in danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when replacing or adjusting the peripheral parts.

2. Tools

Clean the surface of the tool with a cleaning cloth moistened with cleaning fluid before use it.

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Be careful not to damage the tool. If the flawed tool is used, adjustment cannot be performed correctly.

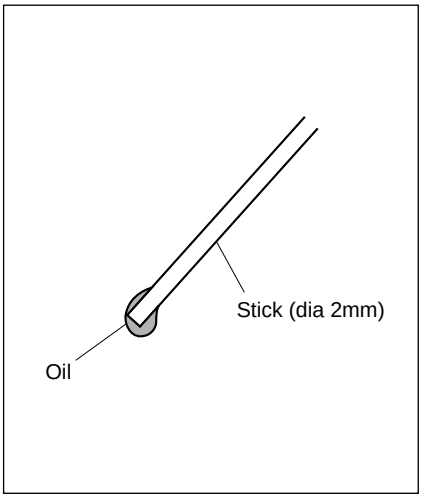
3. Note

(1) Grease and Oil

Please use only the specified grease and oil.
If the different grease or oil is used, major malfunctions may be caused due to differences in viscosity and ingredients.
And if the grease or oil that has been mixed with dust is used, major malfunctions may be caused.
Use the following grease and oil.

- Grease (SGL-505) : 7-661-000-10
- Oil : 7-661-018-18

Smear just enough grease to create a thin film on the surface of the part.
Any grease that adheres to other surrounding parts must be wipe with gauze or soft cloth.



Oil

A drop of oil is defined as follows:
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.

Do not use the grease and oil except for specified portions.

(2) Stop Washer and E Ring

It should not be used the stop washer and E ring once again.
It is recommended checking a required stop washer and E ring before replacement, and preparing more than required number.

3-2. Upper Drum Assembly Replacement

As for replacement time, refer to “Section 5. Periodic Maintenace and Inspection” of the maintenance manual part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Brush/Slip Ring Assembly
4. Release the Demagnetization Head Assembly
5. Remove the Height Determing Plate
6. Remove the Upper Drum Assembly
7. Cleaning (Upper Drum Assembly Mounting Surface, Lower Drum Flange Surface, Tape Running Surface, Lead Surface, and Contacting Points)
8. Install the Upper Drum Assembly
9. Cleaning (Height Determining Plate’s Lower Surface and Upper Surface of Drum Support)
10. Install the Height Determing Plate
11. Put the Demagnetization Head Assembly Back
12. Cleaning (DR-205 Board’s Contacting Points and Brush/Slip Ring Assembly Mounting Surface)
13. Install the Brush/Slip Ring Assembly
14. Connect the Flexible Board (CN2/SE-461 Board)
15. Cleaning (Rotary Heads and Upper Drum’s Tape Running Surface)
16. Install the Video Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running (Refer to Section 4-1-2.)
18. Confirm the Video Tracking (Refer to Section 4-1-3.)
19. Confirm the CTL Head Height (Refer to Section 4-1-4.)
20. Adjust the CTL Head Position (Refer to Section 4-1-5.)
21. Confirm the AT Head Height (Refer to Section 4-1-6.)
22. Confirm the AT Head Azimuth (Refer to Section 4-1-7.)
23. Confirm the AT Head Head-to Tape Contact (Refer to Section 4-1-8.)
24. Adjust the AT Head Position (Refer to Section 4-1-9.)
25. Perform the Electrical Adjustments after Drum Replacement (Refer to Section 5.)

Notes

- When the rotary head tip was worn or damaged, replace the whole upper drum assembly. It cannot be replaced only head tip.
- Never touch the rotating upper drum.

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Basic Knowledge

Replace the upper drum assembly in the following case.

- A correct RF signal waveform cannot be obtained even if the tracking adjustment is performed.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

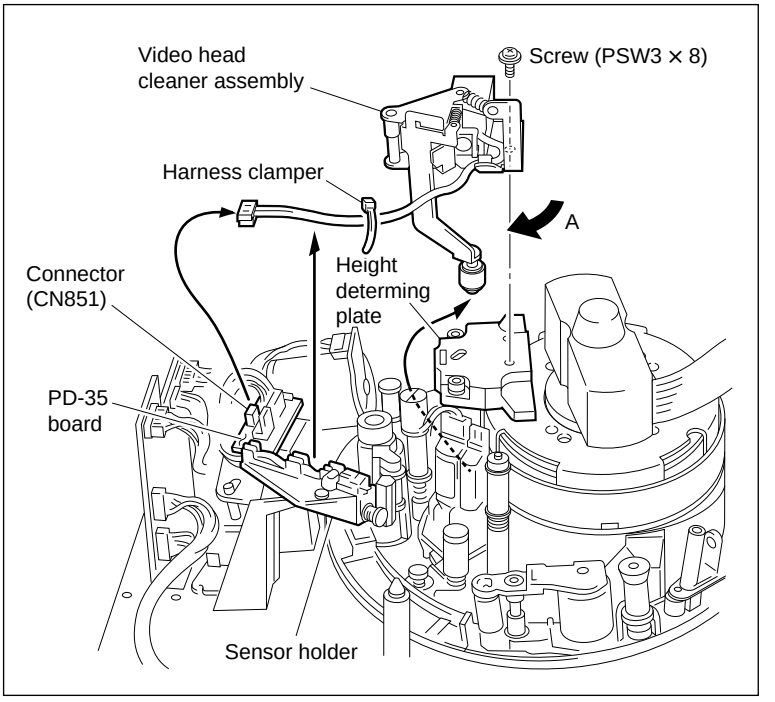
Tools

- Hexagonal wrench driver (2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252) : J-6252-520-A
- Torque screwdriver's bit (+2 mm, l=75 mm) : J-6323-420-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm) : J-6251-090-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Upper drum remover : Supplied with new repair upper drum

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

2. Disconnect the Flexible Board

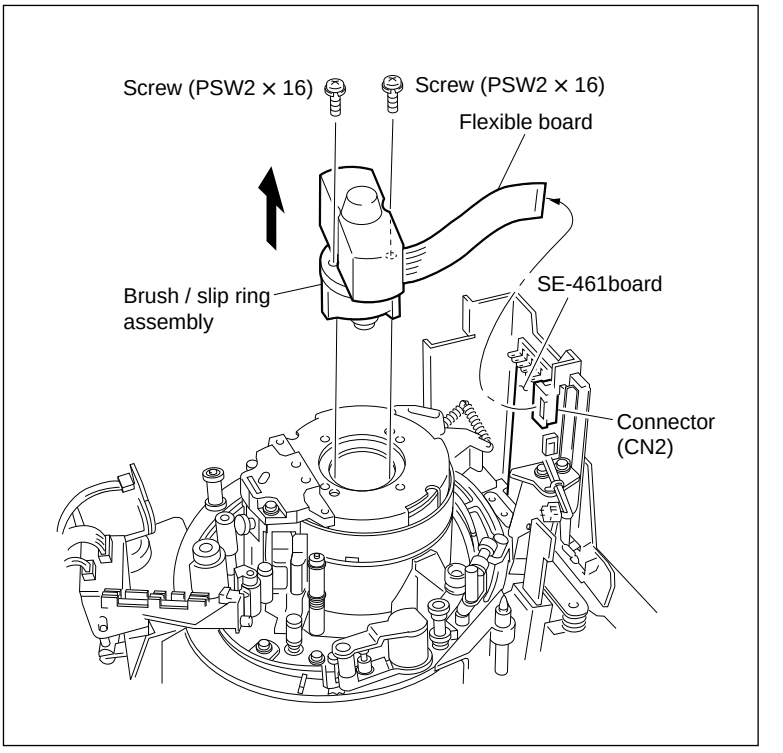
Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Brush/Slip Ring Assembly

Remove the two screws, then remove the brush/slip ring assembly.

CAUTION

- Do not apply excessive force to the brush/slip ring assembly at that time.
- If the screws remain into the screw holes of the brush/slip ring assembly, remove them once. When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



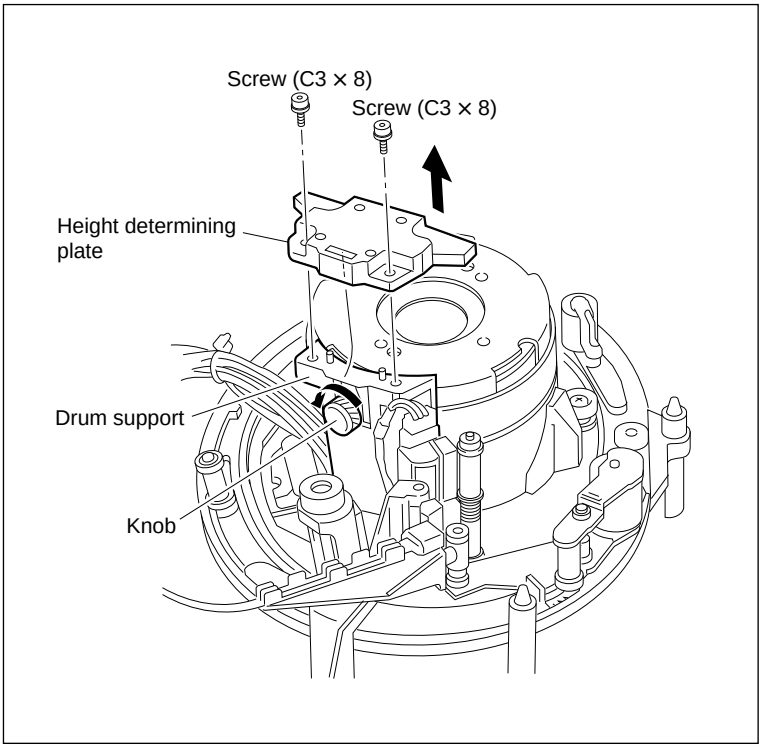
Remove the Brush/Slip Ring Assembly

4. Release the Demagnetization Head Assembly

Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.

5. Remove the Height Determining Plate

(1) Remove the two screws using a hexagonal wrench driver.
(2) Raise the height determining plate just above, then remove.



Remove the Height Determining Plate

6. Remove the Upper Drum Assembly

(1) Insert the hexagonal wrench driver from the screw hole (A) and loosen the screw completely.

Note

The upper drum assembly is fixed with the four fixing screws (C3 × 12) in the screw holes (A). These screws cannot be removed because of stoppers.

(2) Check that the projection of the hexagon screw from remover's surfase is 5 mm or less.

Note

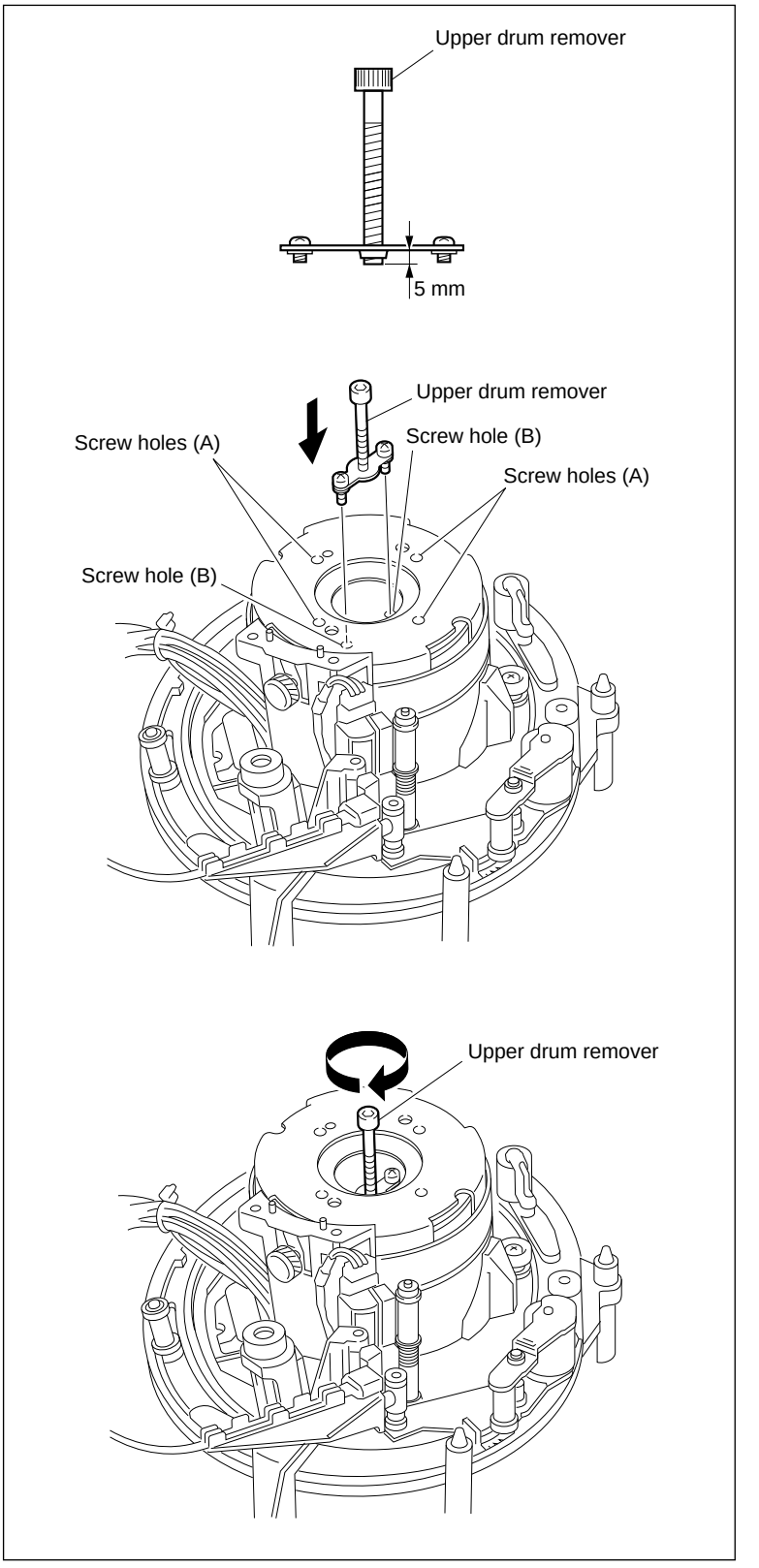
The upper drum remover is supplied with the new repair upper dum.

(3) Attach the upper drum remover to the two screw holes (B) of the brush-slipring assembly with two screws.

(4) Turn the hexagon screw of the upper drum remover clockwise by finger. The upper drum will be detached from the shaft of the lower drum slowly.

Note

If the four upper drum securing screws are not loosened completely and the hexagon screw of the upper drum remover is rotated, the lower drum may be damaged.



Remove the Upper Drum Assembly

Installation

Note

The upper drum cover is supplied with the upper drum as repair parts. And it is used for positioning of the upper drum. Never remove it in carelessly, and follow the instructions described below.

7. Cleaning

(1) Clean the portions below with a cleaning cloth moistened with cleaning fluid.
- New upper drum assembly mounting surfaces (shaded portions shown in the figure)
- Lower drum flanges (shaded portions shown in the figure) and edge portion
- Lower drum's tape running surface and lead portion (Refer to Section 5-2-4.)

Note

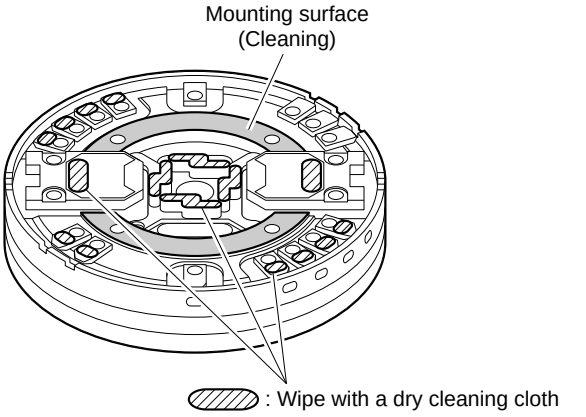
After cleaning, wipe with a dry cleaning cloth.

(2) Wipe the portions shown in figure with a dry cleaning cloth.

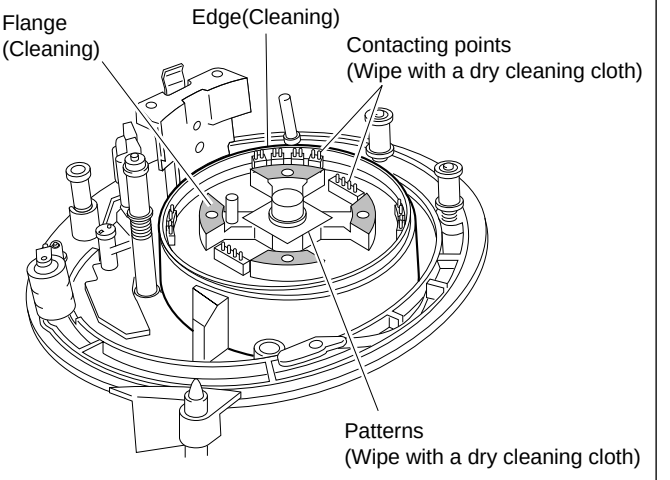
Note

Never apply cleaning fluid to the contacting points and patterns.
- 32 contacting points of upper drum
- 38 patterns of upper drum
- 28 contacting points of lower drum
- 32 patterns of lower drum

• Upper drum ASSY



• Lower drum



Cleaning

8. Install the Upper Drum Assembly

Note

When replacing the upper drum of this model, it is not necessary to do an eccentricity adjustment of the upper drum.

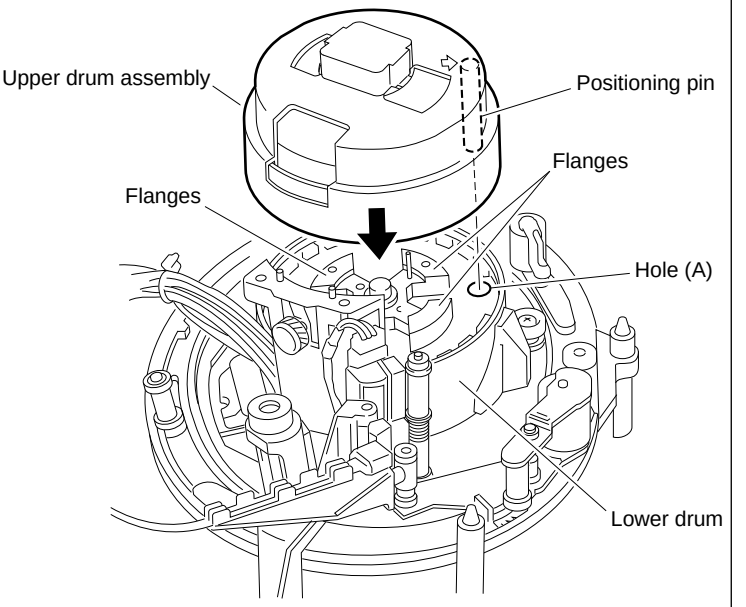
(1) Adjust the position of the hole (A) on DR-372 board with positioning pin on the upper drum cover. (Fig. 1)
(2) Put the upper drum assembly on the central shaft of the lower drum gently while keeping the state of (1).

Notes

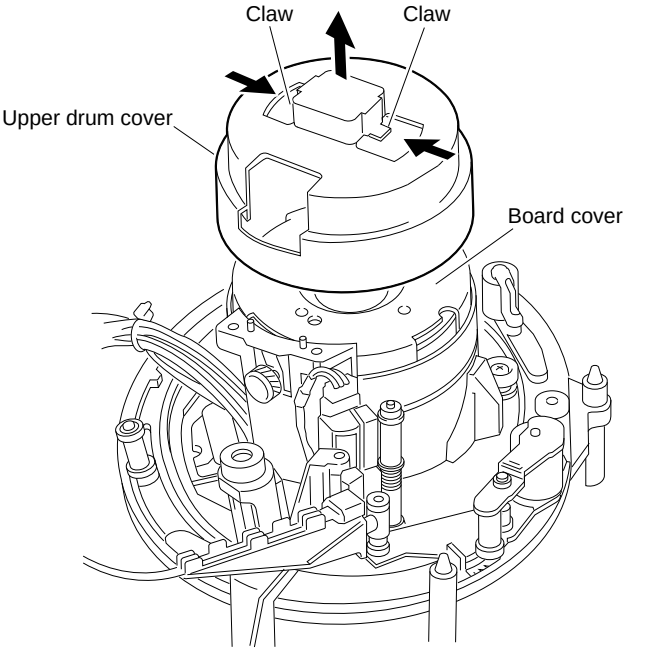
- Never hold the claws of the upper drum cover when installing the upper drum assembly.
- Be careful not to touch the AT head, peripheral tape guides and drum support when installing the upper drum assembly.
- Do not turn the upper drum with the upper drum cover is installed.

(3) Press the claws of the upper drum cover in the direction indicated by the arrows and raise the upper drum cover up, then remove it.
(4) Push the central portion of the upper drum down by finger, and place the upper drum on the flange of the lower drum surely.
(5) Set the torque screwdriver to 39.2×10^{-2} N•m(4.0 kgf • cm). Put the torque screwdriver in the four holes on the board cover of the upper drum assembly while keeping the state of (4). Tighten the four screws in the sequence shown on the board cover gradually.
(6) Set the torque screwdriver to 58.8×10^{-2} N•m(6.0 kgf • cm).
Tighten the four screws in the same sequence as in step (5) using a torque screwdriver.

<Fig.1>



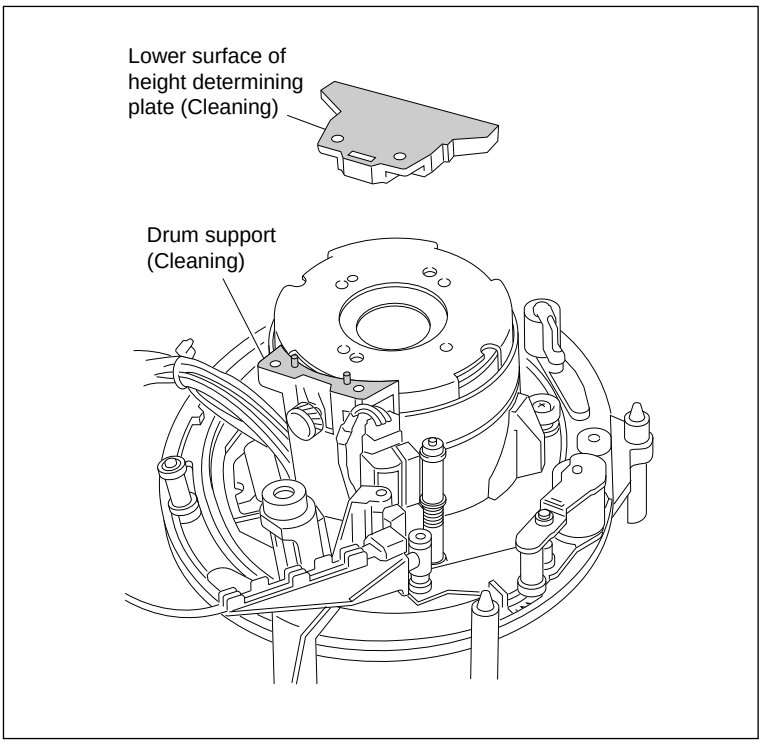
• Remove the upper drum cover



Install the upper Drum Assembly

9. Cleaning

Clean the lower surface (shaded portion in the figure) of the height determining plate and the upper surface of the drum support (shaded portion in the figure) with a soft cloth.



Cleaning

10. Install the Height Determining Plate

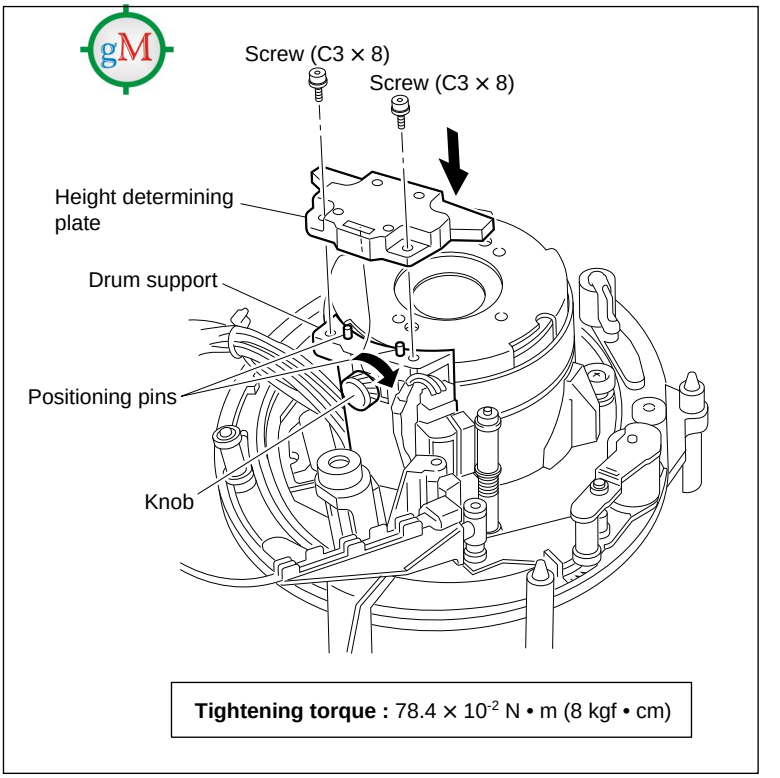
(1) Install the height determining plate so that the positioning pins of the drum support are put into the holes of the height determining plate.

(2) Tighten the two screws alternately and gradually.

Tightening torque: 78.4×10^{-2} N•m (8 kgf • cm)

11. Put the Demagnetization Head Assembly Back

Turn the knob of the demagnetization head assembly clockwise until it will be stopped.



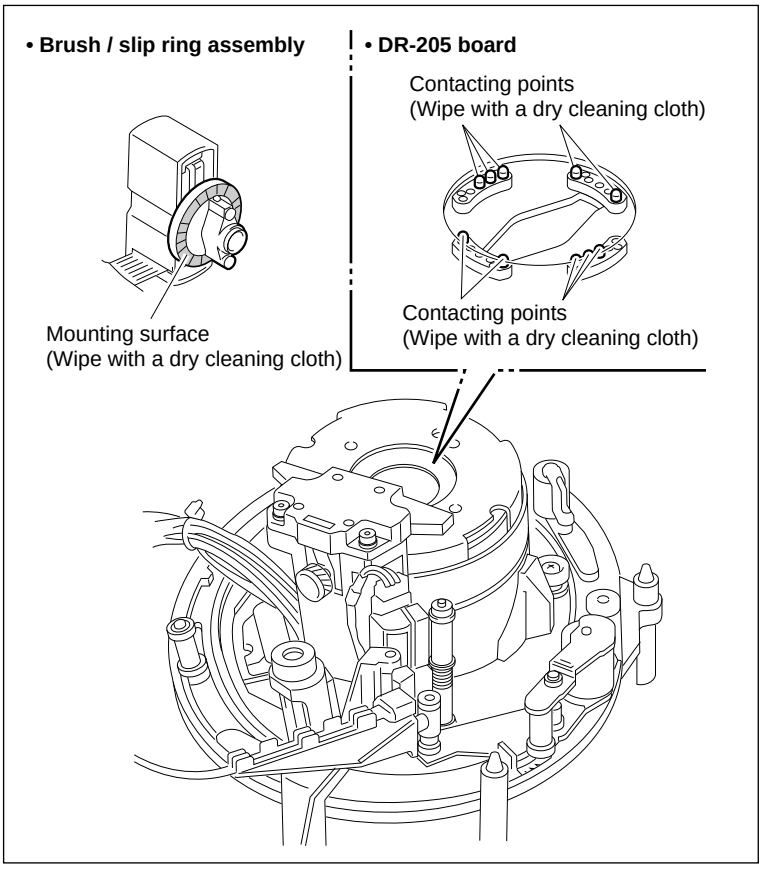
Install the Height Determining Plate/
Put the Demagnetization Head Assembly Back

12. Cleaning

Wipe the brush/slip ring assembly mounting surface (shaded portion in the figure) and contacting points on the DR-205 board with a dry cleaning cloth.

CAUTION

- Do not apply cleaning fluid to the contacting points.
- If the screws remain into the screw holes of the brush/slip ring assembly, remove them once. When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.


• Brush / slip ring assembly
• DR-205 board
Contacting points
(Wipe with a dry cleaning cloth)
Mounting surface
(Wipe with a dry cleaning cloth)
Contacting points
(Wipe with a dry cleaning cloth)

Cleaning

13. Install the Brush/Slip Ring Assembly

(1) Install the brush/slip ring assembly in the direction shown in the figure.

(2) Tighten the two screws alternately and gradually while pushing both sides of the flange equally from above.

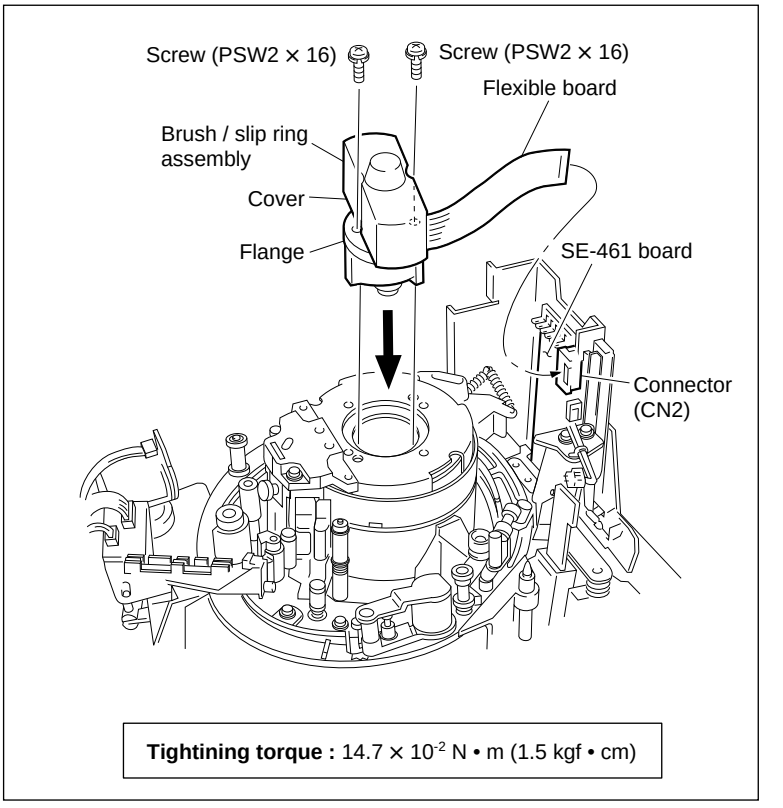
Tightening torque: 14.7×10^{-2} N•m
(1.5 kgf • cm)

CAUTION

Never apply excessive force to the cover.

14. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461board.



Install the Brush/Slip Ring Assembly

15. Cleaning

Clean the portions below.

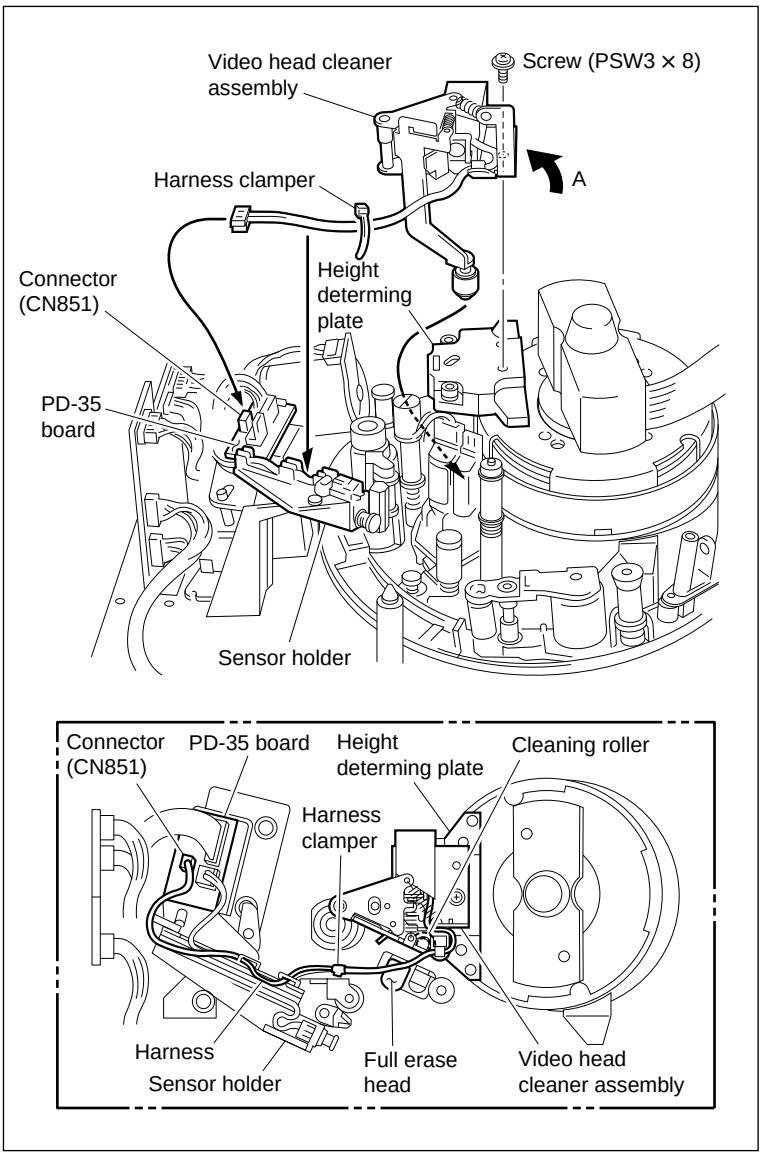
- Video heads and tape running surface of the upper drum. (Refer to Section 5-2-3 of the maintenance manual part1.)

Note

After cleaning, wipe with a dry cleaning cloth.

16. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and full erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the full erase head harness and the rotary head cleaner harness with the harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to Section 3-5, step5.)



Install the Video Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running

Refer to Section 4-1-2.

18. Confirm the Video Tracking

Refer to Section 4-1-3.

19. Confirm the CTL Head Height

Refer to Section 4-1-4.

20. Adjust the CTL Head Position

Refer to Section 4-1-5.

21. Confirm the AT Head Height

Refer to Section 4-1-6.

22. Confirm the AT Head Azimuth

Refer to Section 4-1-7.

23. Confirm the AT Head Head-to-Tape Contact

Refer to Section 4-1-8.

24. Adjust the AT Head Position

Refer to Section 4-1-9.

25. Perform the Electrical Adjustments after Drum Replacement

Refer to Section 5.

3-3. Drum Assembly Replacement

As for replacement time, refer to “Section 5. Periodic Maintennace and Inspection” of the maintenance manual part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Drum Assembly
4. Cleaning (Drum Assembly Mounting Surfaces and Chassis Mounting Surfaces)
5. Install the Drum Assembly
6. Connect the Flexible Board (CN2/SE-461 Board)
7. Cleaning (Rotary Heads, Upper Drum’s Tape Running Surface, and Lower Drum’s Tape Running Surface)
8. Install the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.) (C015: DRUM MOTOR)
10. Confirm the Tape Running (Refer to Section 4-1-2.)
11. Adjust the Video Tracking (Refer to Section 4-1-3.)
12. Adjust the CTL Head Height (Refer to Section 4-1-4.)
13. Adjust the CTL Head Position (Refer to Section 4-1-5.)
14. Adjust the AT Head Height (Refer to Section 4-1-6.)
15. Adjust the AT Head Azimuth (Refer to Section 4-1-7.)
16. Confirm the AT Head Head-to-Tape Contact (Refer to Section 4-1-8.)
17. Adjust the AT Head Position (Refer to Section 4-1-9.)
18. Confirm the Audio Level in REV Mode (Refer to Section 4-1-10.)
19. Confirm the Tape Running (Refer to Section 4-1-2.)
20. Perform the Electrical Adjustment after Drum Replacement (Refer to Section 5.)

Note

Be careful not to damage the AT head and peripheral tape guides when removing or installing the drum assembly.

Basic knowledge

Replace the drum assembly in the following cases.

- The upper or lower drum’s tape running surface is damaged and cannot be repaired.
- A correct RF signal waveform cannot be obtained due to the worn upper or lower drum even if the tracking adjustment is performed.
- The VTR performance deteriorates because of the noise or jitter caused by the bearing life.

Preparation

1. Turn the power off.
2. Remove the Upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part1.)

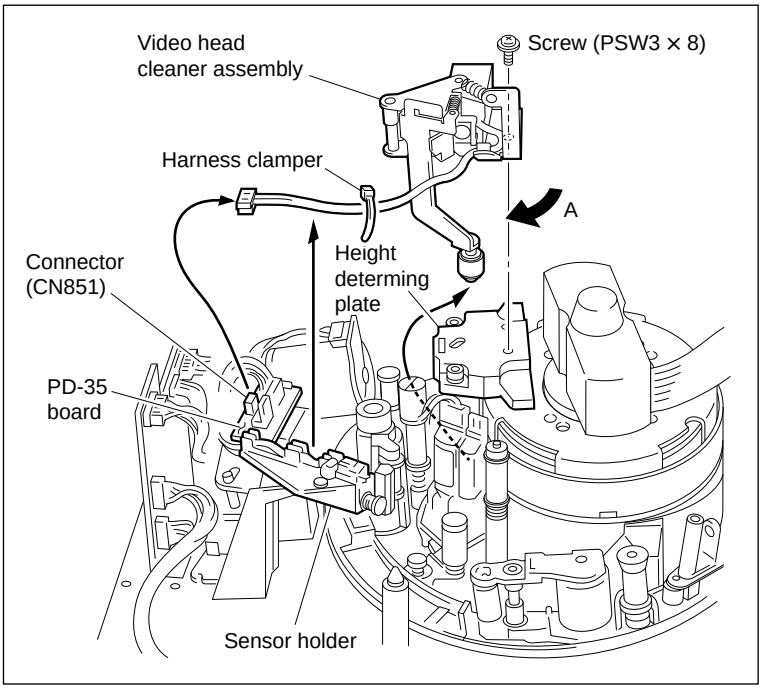
Tools

- Hexagonal wrench driver (2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252) : J-6252-520-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm) : J-6251-090-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

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2. Disconnect the Flexible Board

Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Drum Assembly

(1) Disconnect the connector on the harness rail.

(2) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the lower drum fixing screw.

Note

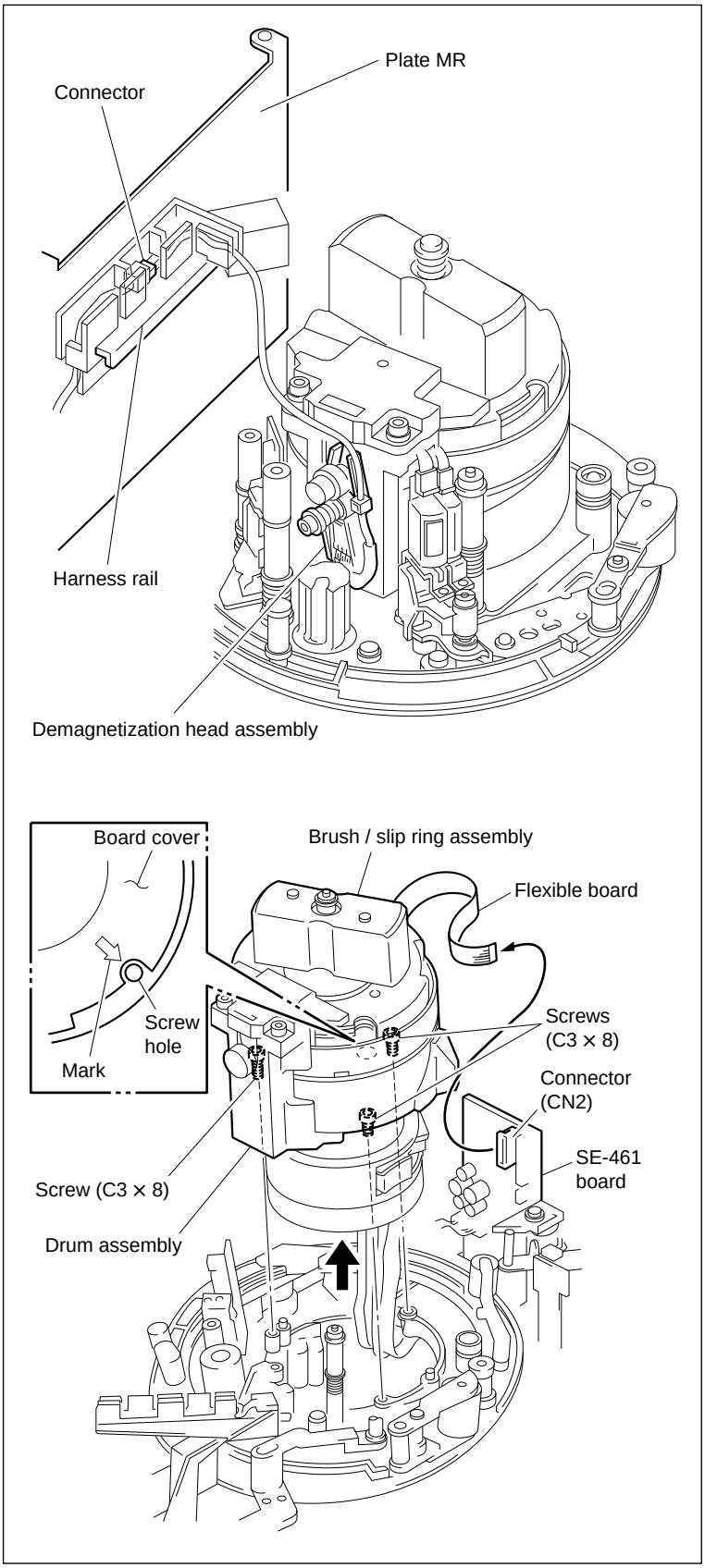
The drum assembly is fixed to the chassis with the three fixing screws (C3 × 8) in the screw hole.

(3) Loosen the screw fully using a hexagonal wrench driver.

Note

These screws cannot be removed because of stoppers.

(4) Rotate the upper drum counterclockwise by finger and loosen other two screws fully in the same way as in steps (2) and (3).



(5) Raise the drum assembly just above and remove the harness from the harness holders at the bottom.

Note

Be careful not to raise the drum assembly by holding the brush/slip ring assembly.

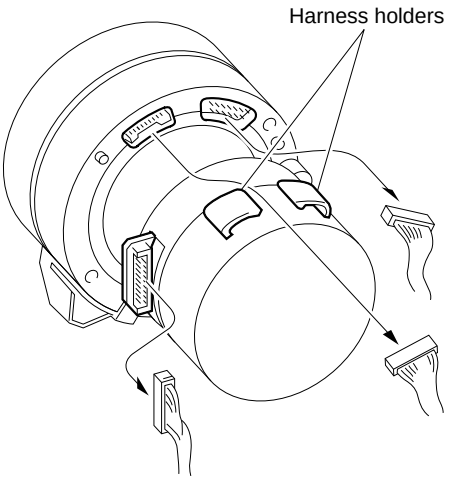
(6) Disconnect three connectors in the state of step (5). The drum assembly can then be removed.

Note

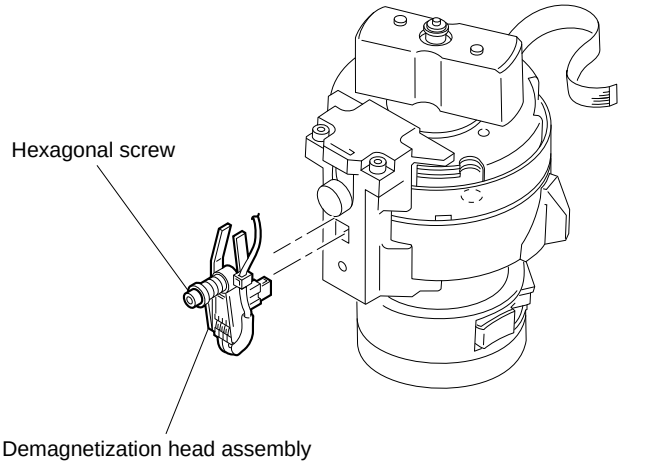
Be careful not to touch the AT head and peripheral tape guides when removing the drum assembly.

(7) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.

• Disconnect the connectors



• Remove the demagnetization head assembly



Remove the Drum Assembly

Installation

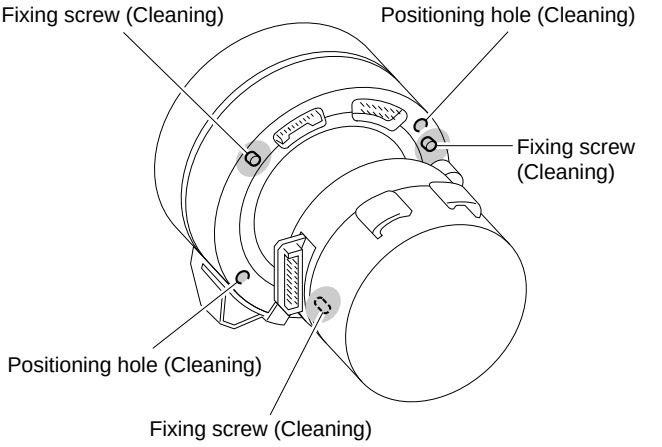
4. Cleaning

Clean a new drum assembly mounting surfaces and chassis mounting surfaces with a cleaning cloth moistened with cleaning fluid.

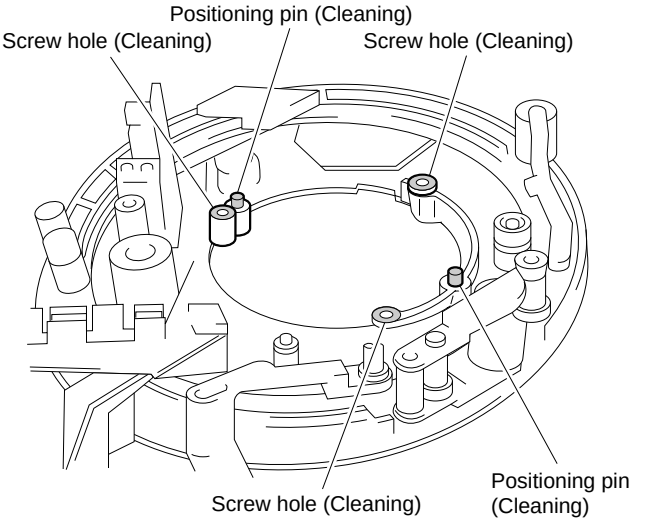
Note

After cleaning, wipe with a dry cleaning cloth.

• Drum assembly



• Chassis



Cleaning

5. Install the Drum Assembly

(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

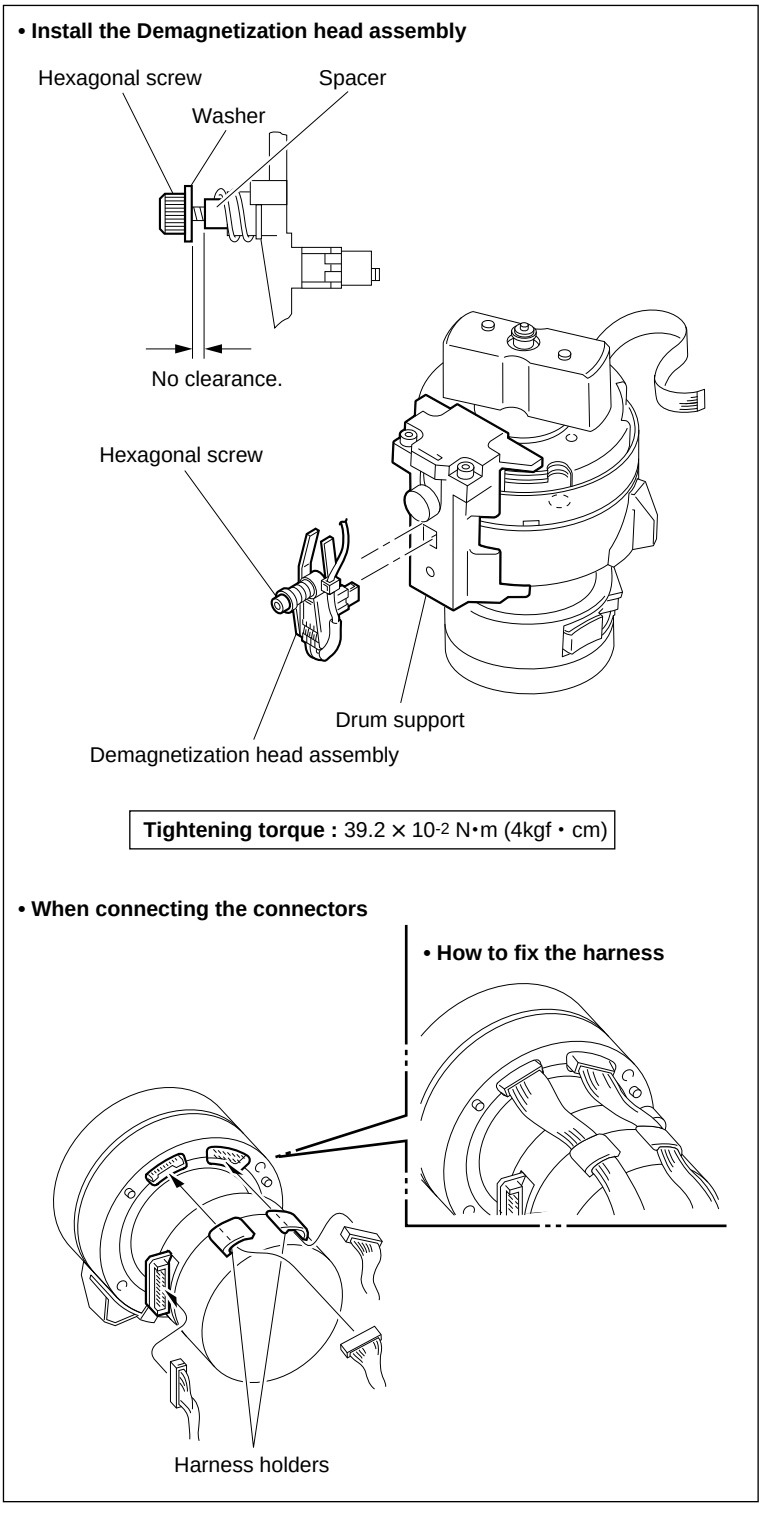
Tightening torque: 39.2×10^{-2} N•m
(4 kgf • cm)

(2) Hold the drum support and connect the three connectors disconnected in (6) of step 3.

CAUTION

- Hold the height determining plate and the drum support at that time. Be careful not to hold the upper drum and the brush/slip ring assembly.
- Pay attention to the direction of the connectors.

(3) Fix the harness by harness holders as shown in the figure.



Install the Drum Assembly

(4) Adjust the two positioning holes of the drum assembly with the two positioning pins of the chassis, and install it to the chassis while passing the harness under the chassis.

CAUTION

1. Be careful not to touch the AT head and tape guide at that time.
2. Be careful not to put the harness between the lower drum and the chassis.

(5) Confirm that the drum assembly is firmly inserted into the positioning pins.
(6) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the fixing screw.
(7) Tighten the screw tentatively.
(8) Tighten other two screws tentatively in the same way as in steps (6) and (7).
(9) Gradually tighten the three screws in the order of counterclockwise.

Tightening torque: 78.4×10^{-2} N•m
(8 kgf • cm)

(10) Connect the connector of the demagnetization head assembly to the connector on the harness rail.

6. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461 board, then lock.

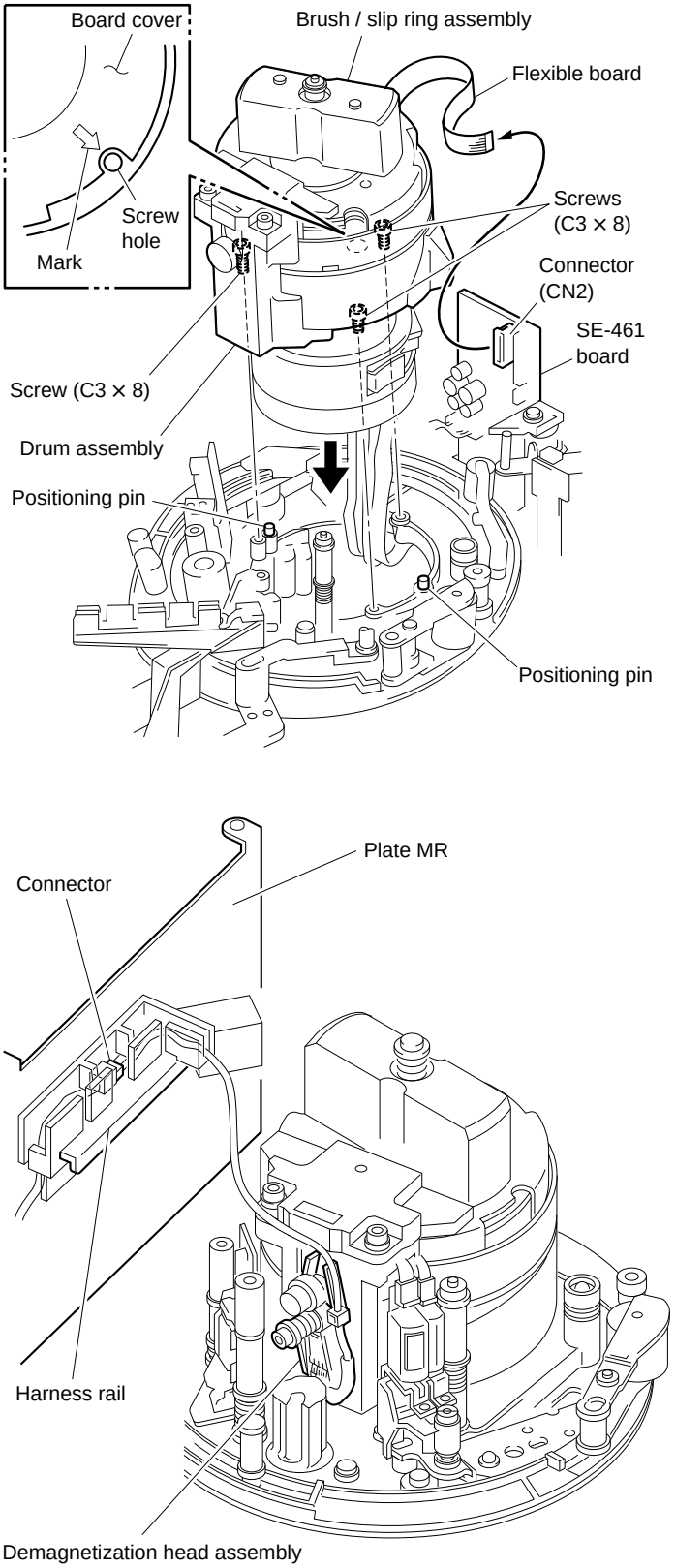
7. Cleaning

Clean the portions below.

(1) Video head and tape running surface of the upper drum. (Refer to Section 5-2-3 of the maintenance manual part 1.)
(2) Lower drum's tape running surface and lead portion. (Refer to Section 5-2-4 of the maintenance manual part 1.)

CAUTION

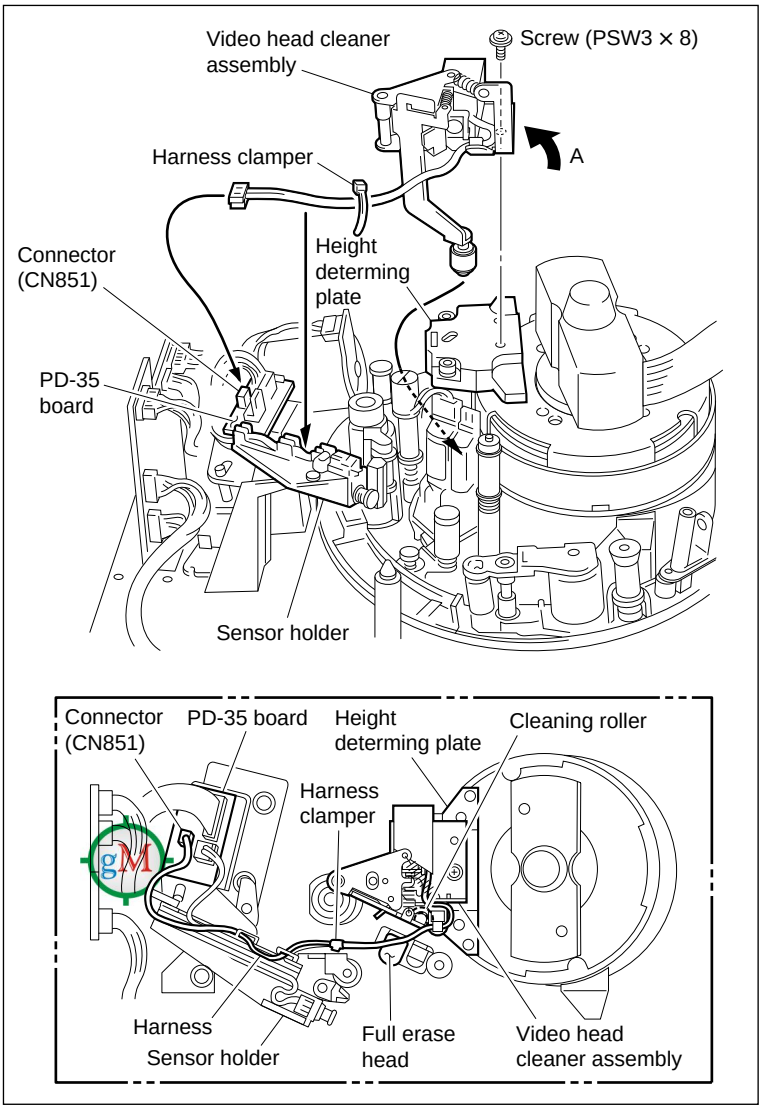
After cleaning, wipe with a dry cleaning cloth.



Install the Drum Assembly

8. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and full erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the full erase head harness and the video head cleaner harness with the harness clamper.
(7) Adjust the position of the cleaning roller. (Refer to section 3-5, step5)



Install the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation
Refer to Section 4-2 of the maintenance manual part 1. (C015: DRUM MOTOR)

10. Confirm the Tape Running
Refer to Section 4-1-2.

11. Adjust the Video Tracking
Refer to Section 4-1-3.

12. Adjust the CTL Head Height
Refer to Section 4-1-4.

13. Adjust the CTL Head Position
Refer to Section 4-1-5.

14. Adjust the AT Head Height
Refer to Section 4-1-6.

15. Adjust the AT Head Azimuth
Refer to Section 4-1-7.

16. Confirm the AT Head Head-to-Tape Contact
Refer to Section 4-1-8.

17. Adjust the AT Head Position
Refer to Section 4-1-9.

18. Confirm the Audio Level in REV Mode
Refer to Section 4-1-10.

19. Confirm the Tape Running
Refer to Section 4-1-2.

20. Perform the Electrical Adjustment after Drum Replacement
Refer to Section 5.

3-4. Brush Slip Ring Assembly Replacement

Replace the brush slip ring assembly every 6,000 hours of the drum rotation.

Outline

Replacement

1. Disconnect the Flexible Board (CN2/SE-461 Board)
2. Remove the brush Slip Ring Assembly
3. Cleaning (Contact Portion of the DR-205 Board and Installation Surface of Brush Slip Ring Assembly)
4. Install the Brush Slip Ring Assembly
5. Connect the Flexible Board (CN2/SE-461 Board)

Adjustment after Replacement

6. DT Check (Refer to Section 4-2-3 of the maintenance manual part 1.) (C060: SG LOOP CHECK)
7. RF Check (Refer to Section 4-2-4 of the maintenance manual part 1.) (C1: RF CHECK)

Note

Replace the brush slip ring assembly when the brush or slip ring is worn or damaged. The brush slip ring assembly cannot be replaced by only the brush or slip ring.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Disconnect the Flexible Board

Disconnect the flexible board from the connector CN2 on the SE-461 board.

2. Remove the Brush Slip Ring Assembly

(1) Remove the two screws, then remove the brush slip ring assembly.

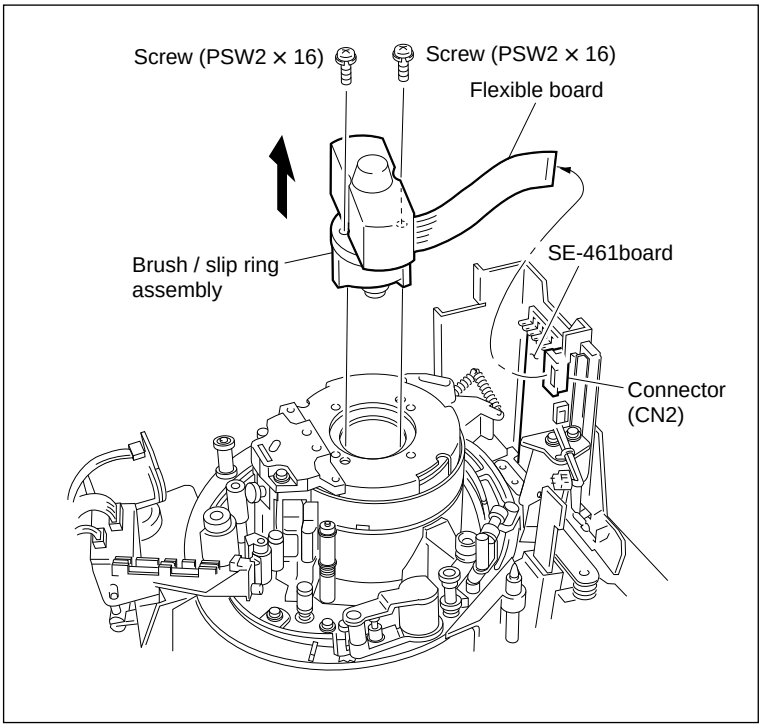
Note

Do not apply any force forcibly to the brush slip ring assembly at that time.

(2) Turn the brush slip ring assembly upside down and take out the screws.

Note

Be careful not to drop the screws in the cover at that time.



Remove the Brush Slip Ring Assembly

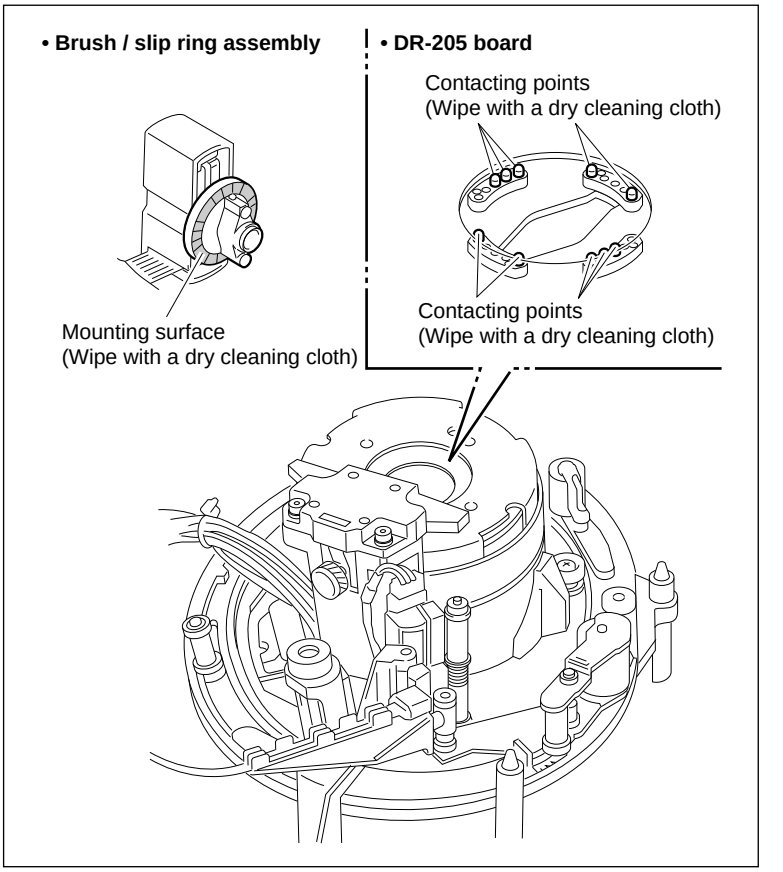
Installation

3. Cleaning

Wipe the mounting surface (the portion in the figure) of the brush slip ring assembly and the contacting points of the DR-205 board with a dry cleaning cloth.

Note

Never apply cleaning fluid to the contact portions.


• Brush / slip ring assembly
• DR-205 board
Contacting points (Wipe with a dry cleaning cloth)
Mounting surface (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)

Cleaning

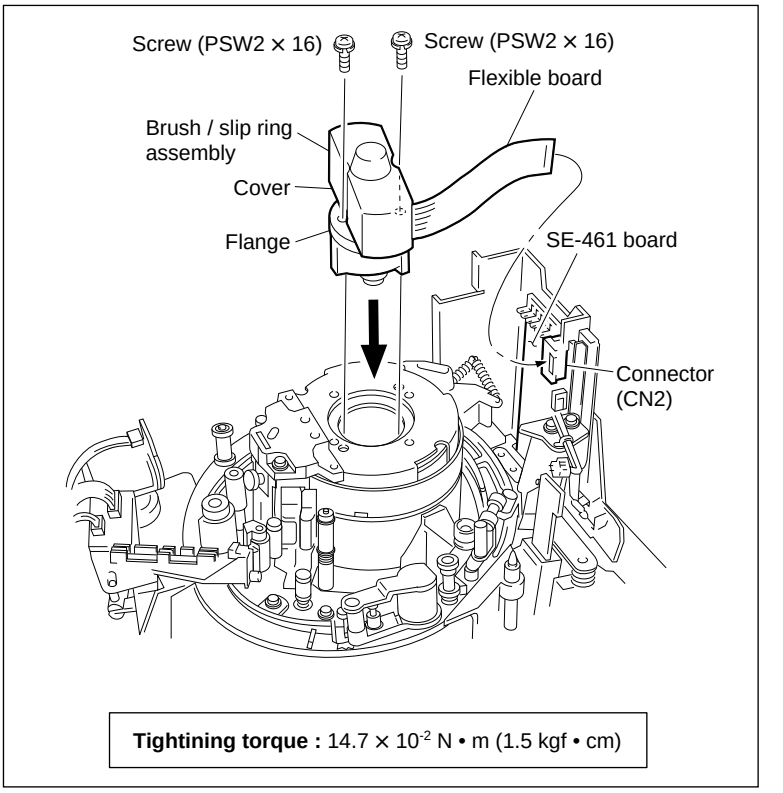
4. Install the Brush Slip Ring Assembly

(1) Insert the two screws taken out in (2) of step 2 into the screw holes of the brush slip ring assembly.
(2) Install the brush slip ring assembly in the direction shown in the figure.
(3) Tighten the two screws alternately and gradually while pushing both sides of the flange uniformly.

Tightening torque: 14.7×10^{-2} N • m
(1.5 kgf • cm)

5. Connect the Flexible Board

Connect the flexible board to the connector CN2 on the SE-461 board, then lock.



Install the Brush Slip Ring Assembly

Adjustment after Replacement

6. DT Check

Refer to Section 4-2-3 of the maintenance manual part 1. (C060: SG LOOP CHECK)

7. RF Check

Refer to Section 4-2-4 of the maintenance manual part 1. (C1: RF CHECK)

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3-5. Cleaning Roller and Video Head Cleaner Assembly Replacement

Replace the cleaning roller every 6,000 hours of the drum rotating.
Replace the video head cleaner assembly ealier time either 6,000 hours of the drum rotating or 200,000 times of the threading.
The cleaning roller is included in the video head cleaner assembly.

Outline

Replacement

1. Remove the Harness (CN851/PD-35 Board)
2. Remove the Video Head Cleaner Assembly
3. Replace the Cleaning Roller
4. Install the Video Head Cleaner Assembly
5. Adjust the Cleaning Roller Position
6. Install the Harness (CN851/PD-35 Board)

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation (Refer to Section 4-2 of the maintenance manual part 1.)
   (C023: CLEANING ROLLER)

Note

When the cleaning roller is replaced, it is recommended to replace the CR spacer at the same time.
CR spacer : 3-182-765-02

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part1.)

Removal

1. Remove the Harness

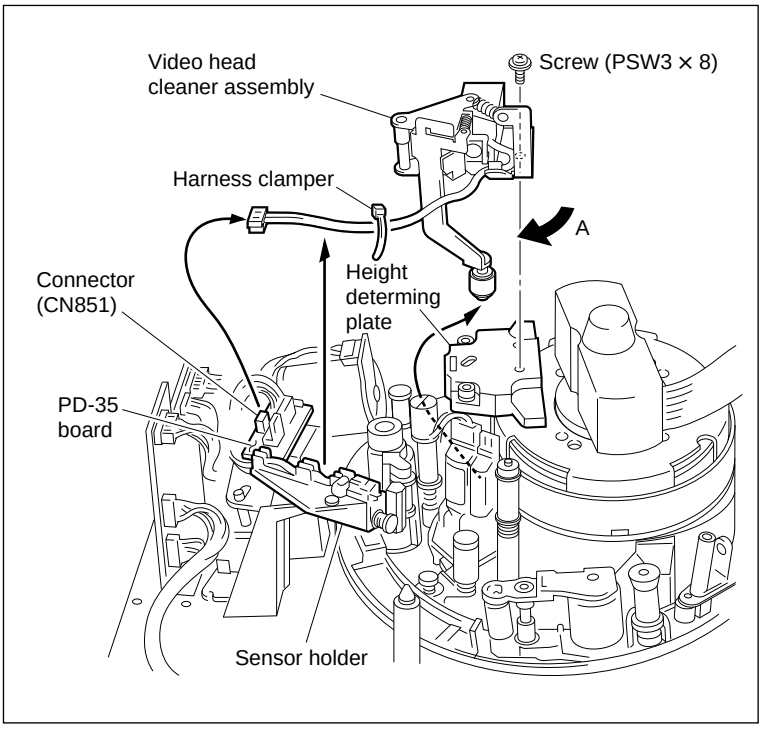
(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.

2. Remove the Video Head Cleaner Assembly

Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

Perform step 5 and later when replacing the video head cleaner assembly.
Perform step 3 and later when replacing the cleaning roller.



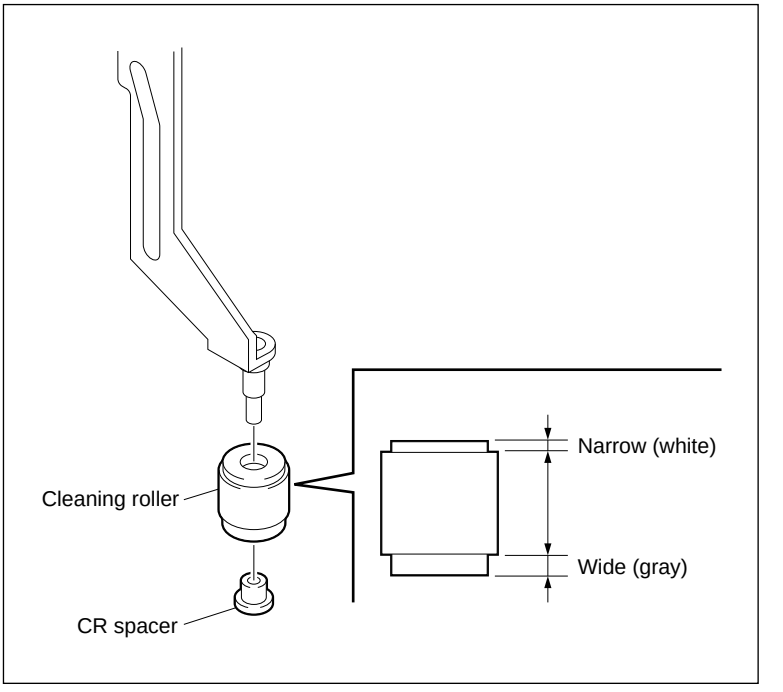
Remove the Video Head Cleaner Assembly

3. Replace the Cleaning Roller

(1) Remove the CR spacer, and remove the cleaning roller.
(2) Pass a new cleaning roller through the shaft as shown in the figure. Then fix the cleaning roller by new CR spacer.
(3) Move the cleaning roller in the vertical direction.
At this time, confirm that there is no vertical play.

Note

Do not reverse the direction of the cleaning roller. The height between the cleaing roller and head is shifted in this case.

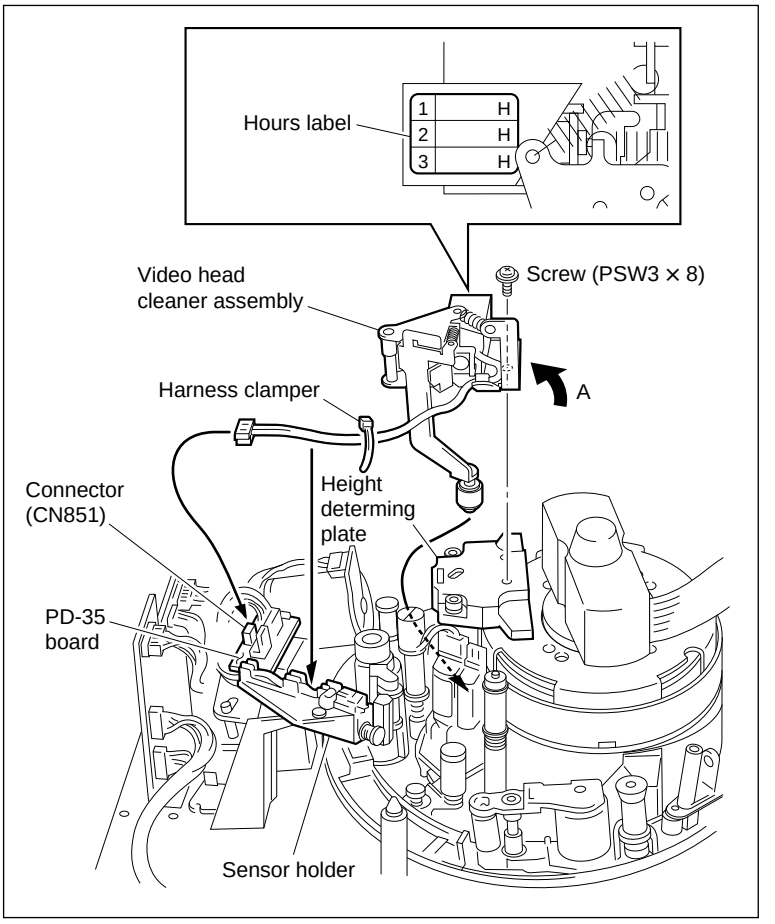


Replace the Cleaning Roller

Installation

4. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller from the clearance between the height determing plate and the full erase head.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while moving the video head cleaner assembly in the direction indicated by the arrow A (counterclookwise).
(4) Fill in the hours of the cleaning roller replacement on the hours label sticked on the video head cleaner assembly.



Install the Video Head Cleaner Assembly

5. Adjust the Cleaning Roller Position

(1) Check that the cleaning roller does not come in contact with the upper drum as visual. (Specification 1)

If the cleaning roller comes in contact with the upper drum, bend the portion B of the arm plate assembly in the direction of the arrow C.

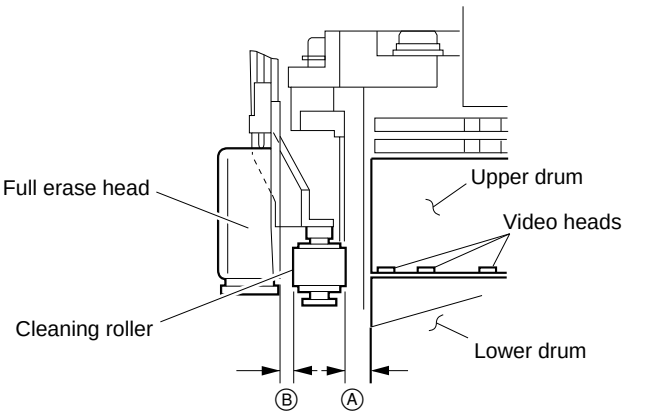
(2) Check that the cleaning roller does not come in contact with the terminal on the full erase head as visual. (Specification 2)

If the cleaning roller comes in contact with the terminal on the full erase head, bend the portion B of the arm plate assembly in the direction of the arrow D.

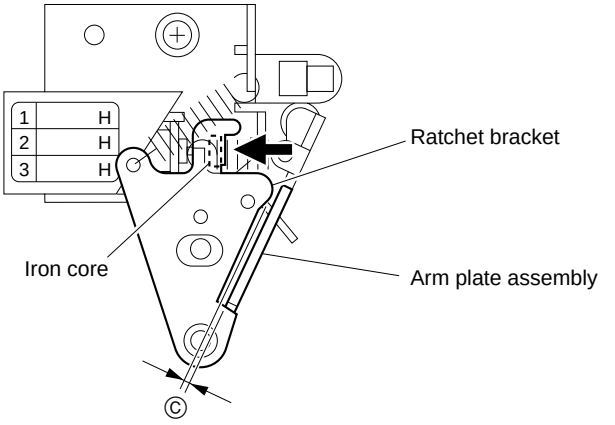
(3) Press the iron core in the direction of the arrow. At that time, check that clearance exists between the ratchet bracket and the arm plate assembly. (Specification 3)

If clearance does not exist, bend the portion B of the arm plate assembly in the direction of the arrow D.

(4) Repeat steps (1) through (3) above until the specifications 1 through 3 are satisfied.

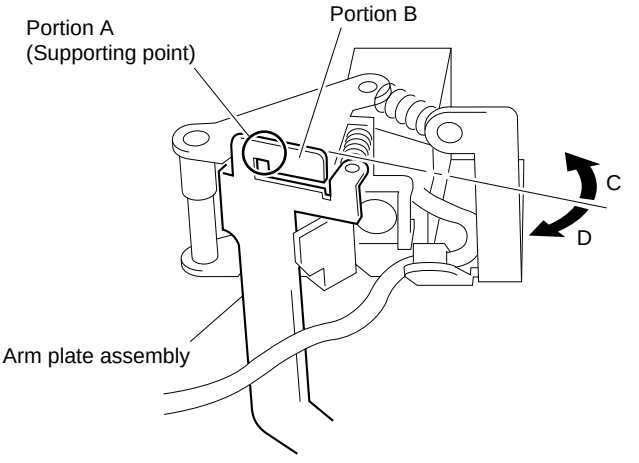


Spec. 1 : Ⓐ = Clearance exists.
Spec. 2 : Ⓑ = Clearance exists.



Spec. 3 : Ⓒ = Clearance exists.

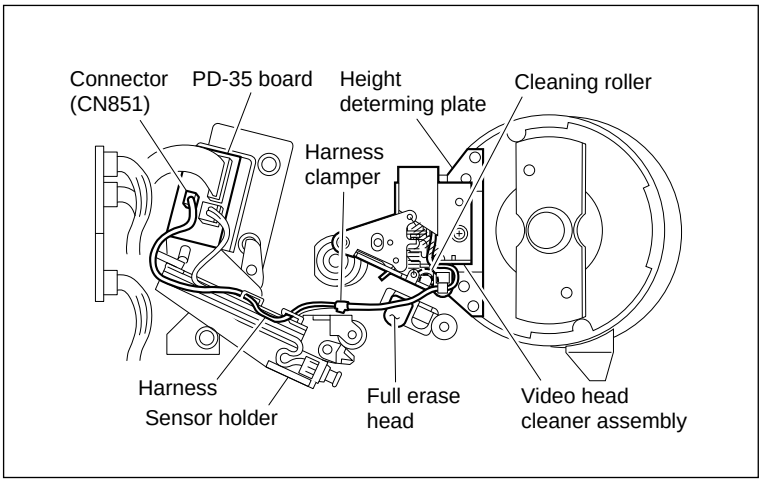
• When the specifications 1or 2 are not satisfied.



Adjust the Cleaning Roller Position

6. Install the Harness

(1) Fix the harness to the position on the sensor holder shown in the figure.
(2) Connect a harness on the video head cleaner assembly into connector CN851 on the PD-35 board.
(3) Bind the video head cleaner harness and the CTL head harness with the harness clamper (or equivalent).



Install the Harness

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C023: CLEANING ROLLER)

3-6. AT Head Cleaner Replacement

Replace the AT head cleaner every 2,000 hours of drum rotating.

Outline

Replacement

1. Remove the CL Arm Assembly
2. Install the CL Arm Assembly
3. Confirm the CL Arm Assembly Operation

Note

1. When the cleaning roller is dirty or damaged, replace the CL arm assembly.
2. Adjustment after the CL arm assembly replacement is not required. However, confirm the CL arm assembly operation.
3. When replacing the CL arm assembly, prepare a new stop washer.
   Stop washer(2.3):3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Removal

1. Remove the CL Arm Assembly

(1) Turn the M gear of the gear box assembly manually and move the CL arm assembly to the position shown in the figure.

Note

Move the CL arm assembly to the front of the SE-461 board. If not, the CL arm assembly cannot be removed because the stop washer is hidden by other parts.

(2) Remove the stop washer at the top of the CL arm assembly.

(3) Remove the CL arm assembly from the threading ring.

Note

Do not remove the spring at the bottom of the CL arm from the shaft.

Installation

2. Install the CL Arm Assembly

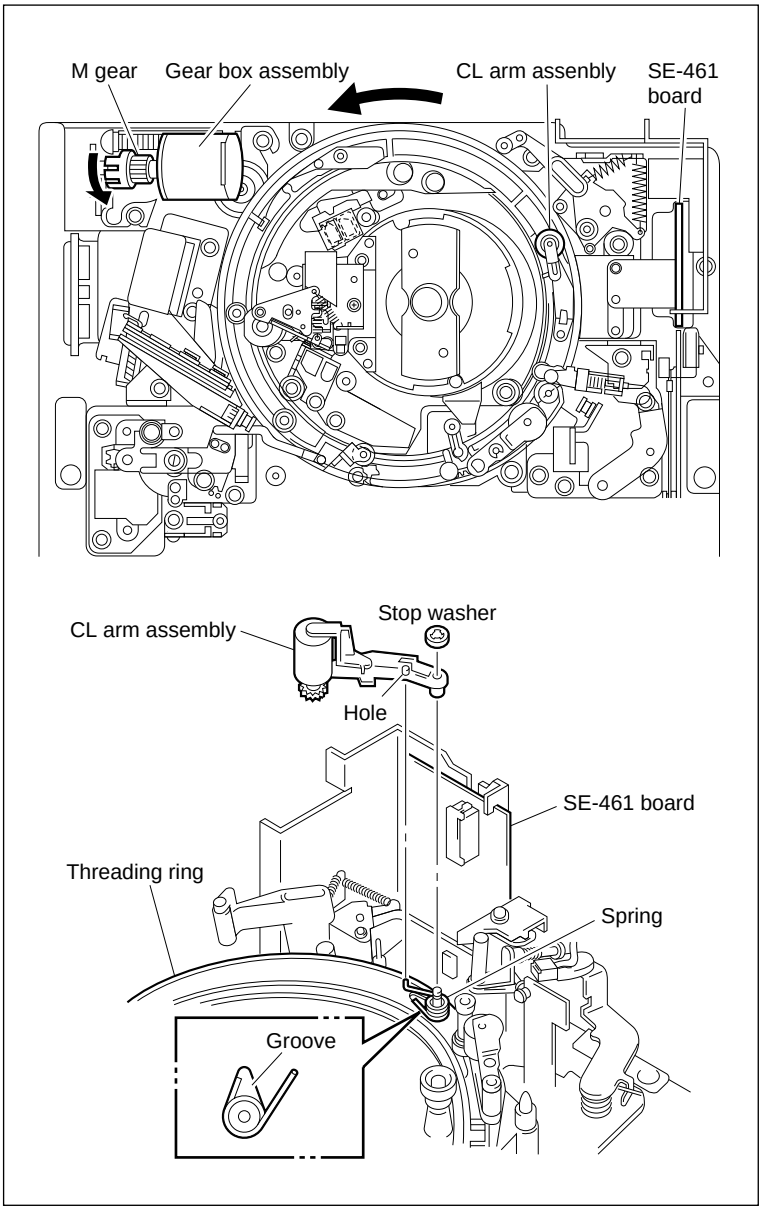
(1) Pass a new CL arm assembly through the shaft while hooking the spring as shown in the figure.

Note

Insert the short-end of the spring into the groove of the threading ring and the long-end spring into the hole of the CL arm assembly.

(2) Fix the CL arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00



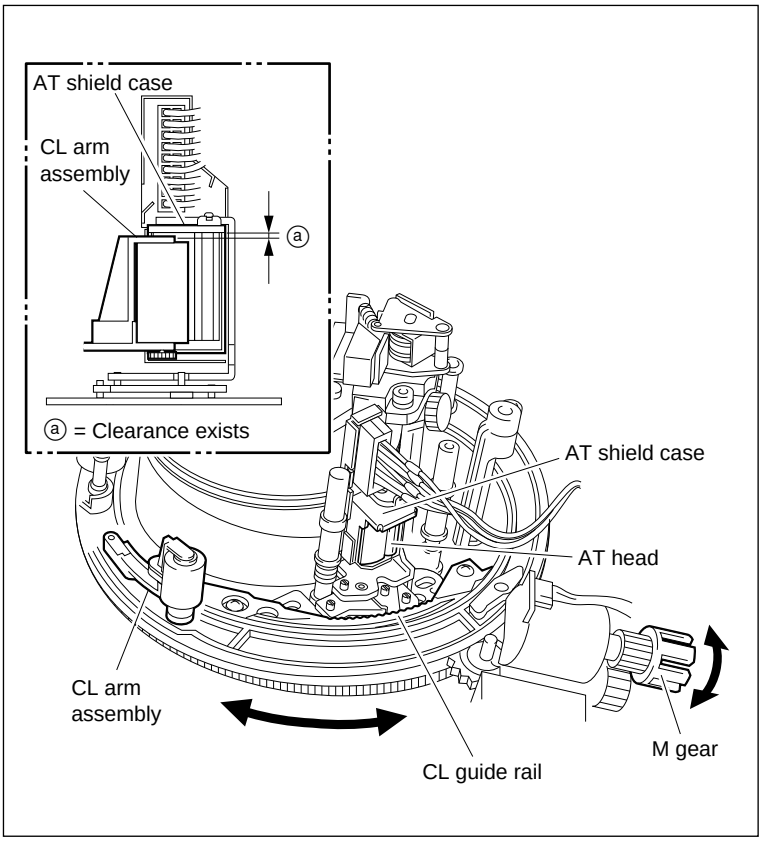
Remove the CL Arm Assembly

3. Confirm the CL Arm Assembly Operation

(1) Turn the M gear of the gear box assembly manually and confirm the items below while repeating the threading and unthreading.

- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the CL arm assembly and shield case while the AT head is cleaned.

(2) Turn the power on and confirm that the CL arm assembly smoothly operates while repeating the threading and unthreading.



Confirm the CL Arm Assembly Operation

3-7. CTL Head Replacement

Outline

Replacement

1. Disconnect the Connectors
2. Remove the CTL/FE Head Assembly
3. Remove the CTL Head
4. Install the CTL Head
5. Install the CTL/FE Head Assembly
6. Connect the Connectors
7. Cleaning (CTL and Full Erase Head Surface)

Adjustment after Replacement

8. Confirm the Tape Running (Refer to Section 4-1-2.)
9. Adjust the CTL Head Height (Refer to Section 4-1-4.)
10. Adjust the CTL Head Position (Refer to Section 4-1-5.)
11. Confirm the Tape Running (Refer to Section 4-1-2.)
12. Confirm the AT Head Position (Refer to Section 4-1-9.)
13. Adjust the Drum Phase (Refer to Section 5-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kgf•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm) : J-6323-420-A

Removal

1. Disconnect the Connector

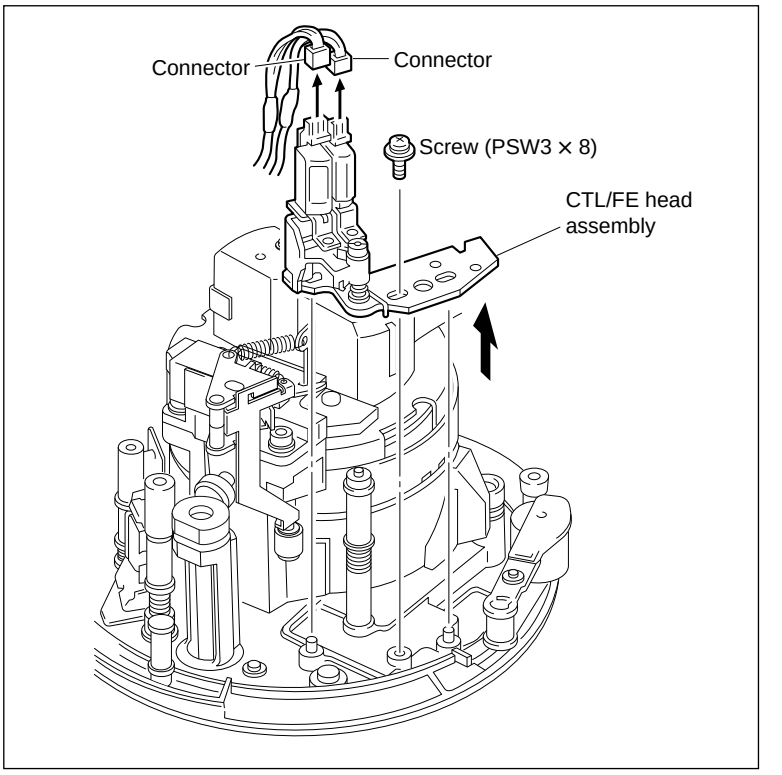
Disconnect the connectors on the CTL head board and the full erase head board.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the CTL/FE Head Assembly

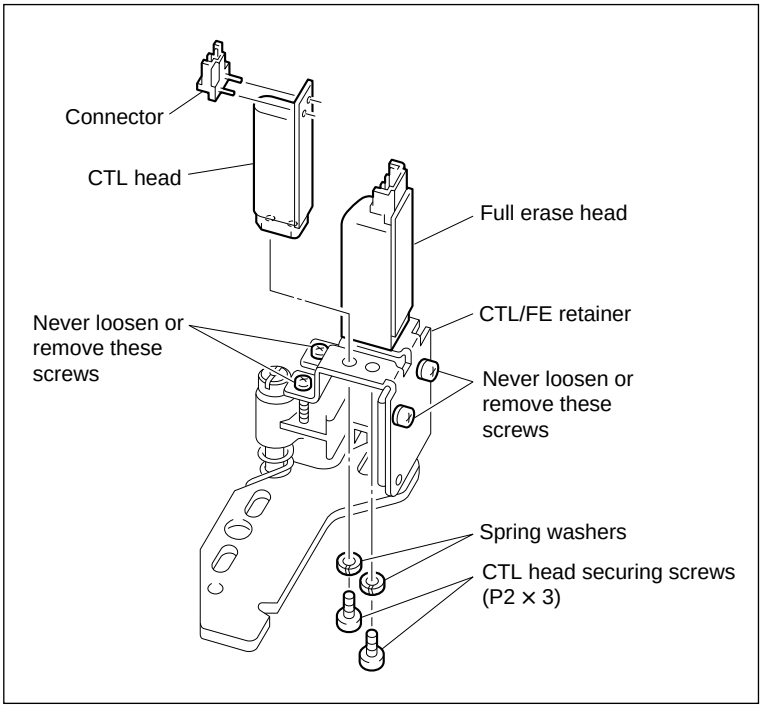
3. Remove the CTL Head

(1) Remove the two CTL head securing screws, then remove the CTL head.

Notes

- When removing the CTL head, be careful not to damage the full erase head.
- Never loosen or remove the screws except for the CTL head securing screws. If these screws are loosened or removed, the zenith of the CTL and the full erase head will be out of specification.

(2) Unsolder the connector pins.



Remove the CTL Head

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Installation

4. Install the CTL Head

(1) Solder the connector pin to the CTL head board.

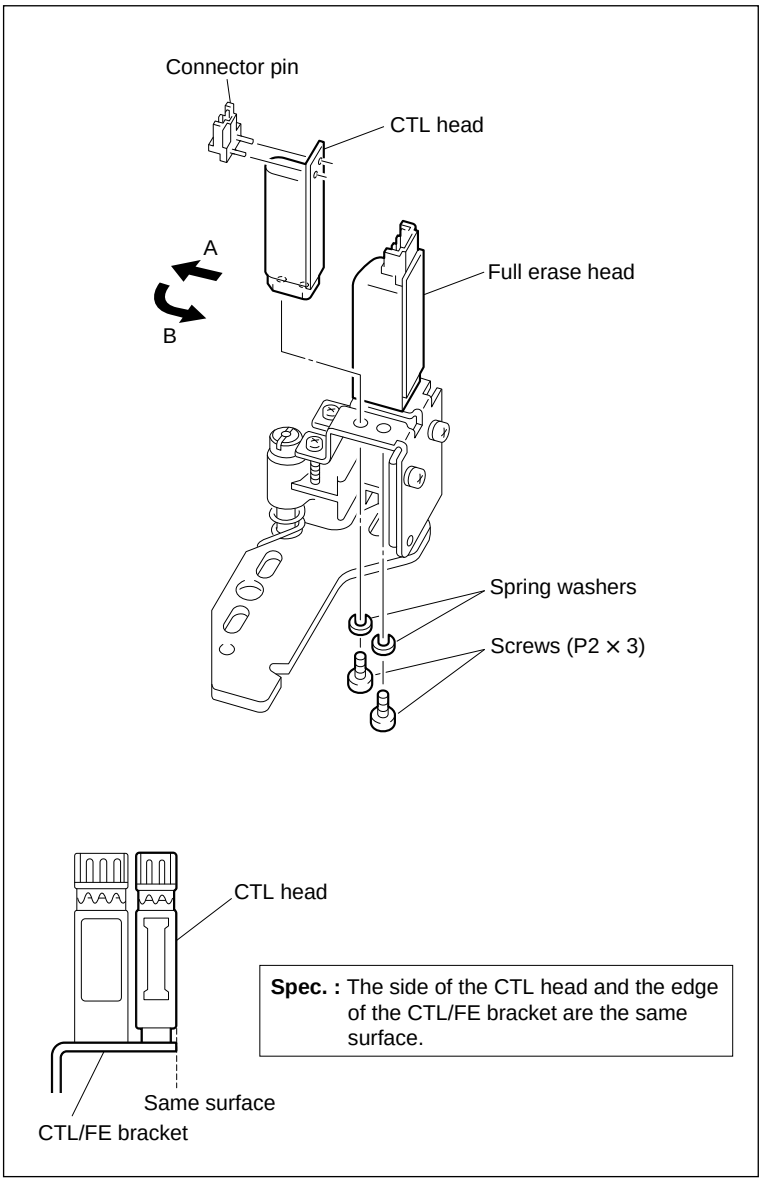
(2) Tighten the two screws temporarily while moving the CTL head in the direction indicated by arrows A and B.

Note

Be careful not to damage the CTL and full erase head.

(3) Tighten the two screws if it is within the specification.

Tightening torque : 19.6×10^{-2} N•m (2.0 kgf•cm)



Install the CTL Head

5. Install the CTL/FE Head Assembly

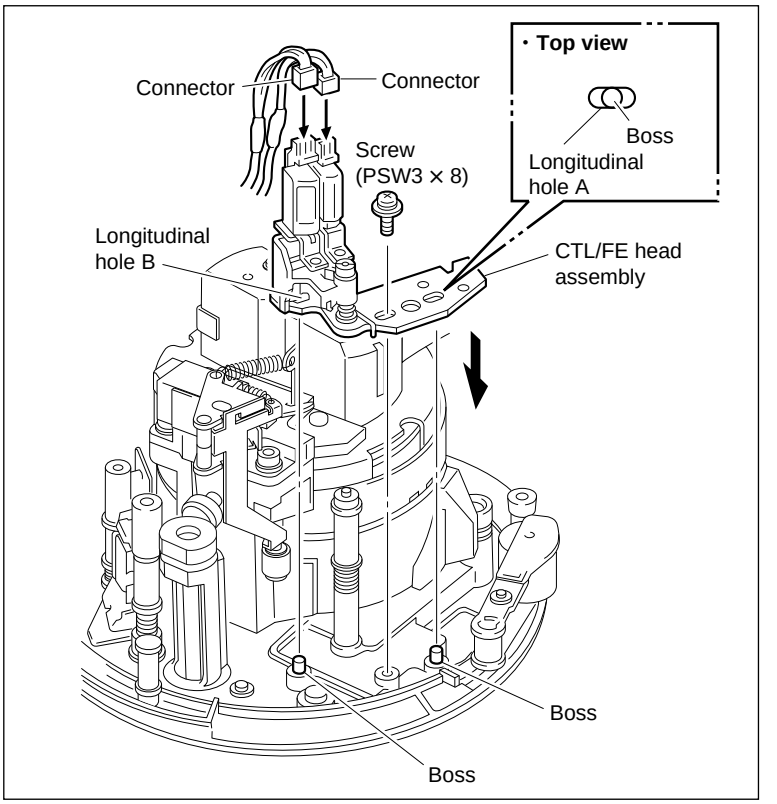
(1) Confirm that the threading ring is in the unthreading end state.

(2) Align the longitudinal holes A and B of the CTL/FE head assembly with the bosses of the chassis.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.

(3) Align the boss of the chassis with center of the longitudinal hole A and tighten the screw.



Install the CTL/FE Head Assembly

6. Connect the Connector

Connect the connectors to the CTL head board and the full erase head board.

7. Cleaning

Clean the tape running surfaces of the CTL head and the full erase head with a cleaning cloth moistened with cleaning fluid.

Adjustment after Replacement

8. Confirm the Tape Running

Refer to Section 4-1-2.

9. Adjust the CTL Head Height

Refer to Section 4-1-4.

10. Adjust the CTL Head Position

Refer to Section 4-1-5.

11. Confirm the Tape Running

Refer to Section 4-1-2.

12. Confirm the A/T Head Position

Refer to Section 4-1-9.

13. Adjust the Drum Phase

Refer to Section 5-2.

3-8. Full-erase Head Replacement

Outline

Replacement

1. Disconnect the Harness
2. Remove the CTL/FE Head Assembly
3. Remove the Full-erase Head
4. Install the Full-erase Head
5. Install the CTL/FE Head Assembly
6. Connect the Harness
7. Cleaning (Surface of Full-erase Head and CTL Head)

Adjustment after Replacement

8. Adjust the Tape Running (Refer to Section 4-1-2.)
9. Confirm the CTL Head Height (Refer to Section 4-1-4.)
10. Adjust the CTL Head Position (Refer to Section 4-1-5.)
11. Confirm the Tape Running (Refer to Section 4-1-2.)
12. Confirm the AT Head Position (Refer to Section 4-1-9.)
13. Adjust the Drum Phase (Refer to Section 5-2.)
14. Confirm the Full-erase Current (Refer to Section 2.)
15. Confirm the Full-erase Head's Erasure Ratio (Refer to Section 2.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver bit (+2 mm, l = 75 mm): J-6323-420-A

Removal

1. Disconnect the Harness

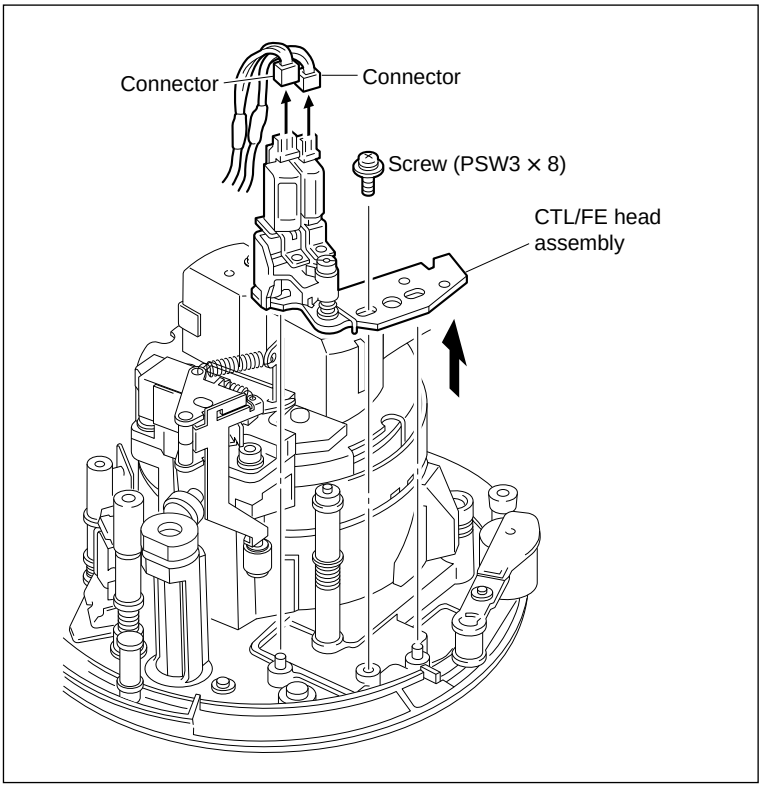
Disconnect the harness from the connectors on the CTL head board and the full-erase head board.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.



Remove the CTL/FE Head Assembly

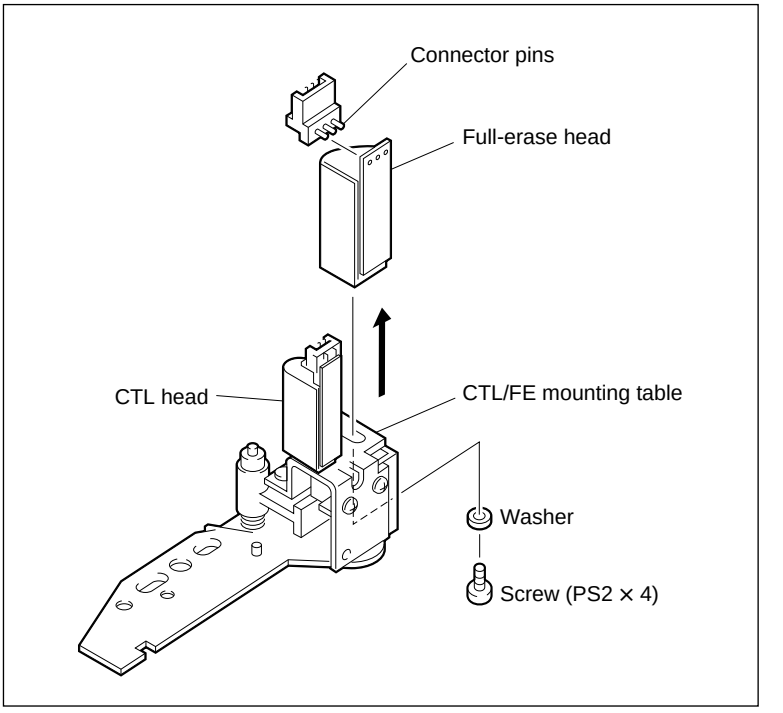
3. Remove the Full-erase Head

(1) Remove the screw and washer, then remove the full-erase head.

Notes

1. Be careful not to damage the CTL head when the full-erase head is removed.
2. Do not loosen or remove the two screws fixing the CTL/FE mounting table. This causes the deviation in the zenith of the CTL head and full-erase head.

(2) Unsolder the connector pins.



Remove the Full-erase Head

Installation

4. Install the Full-erase Head

(1) Solder the connector pins to a new full-erase head board.

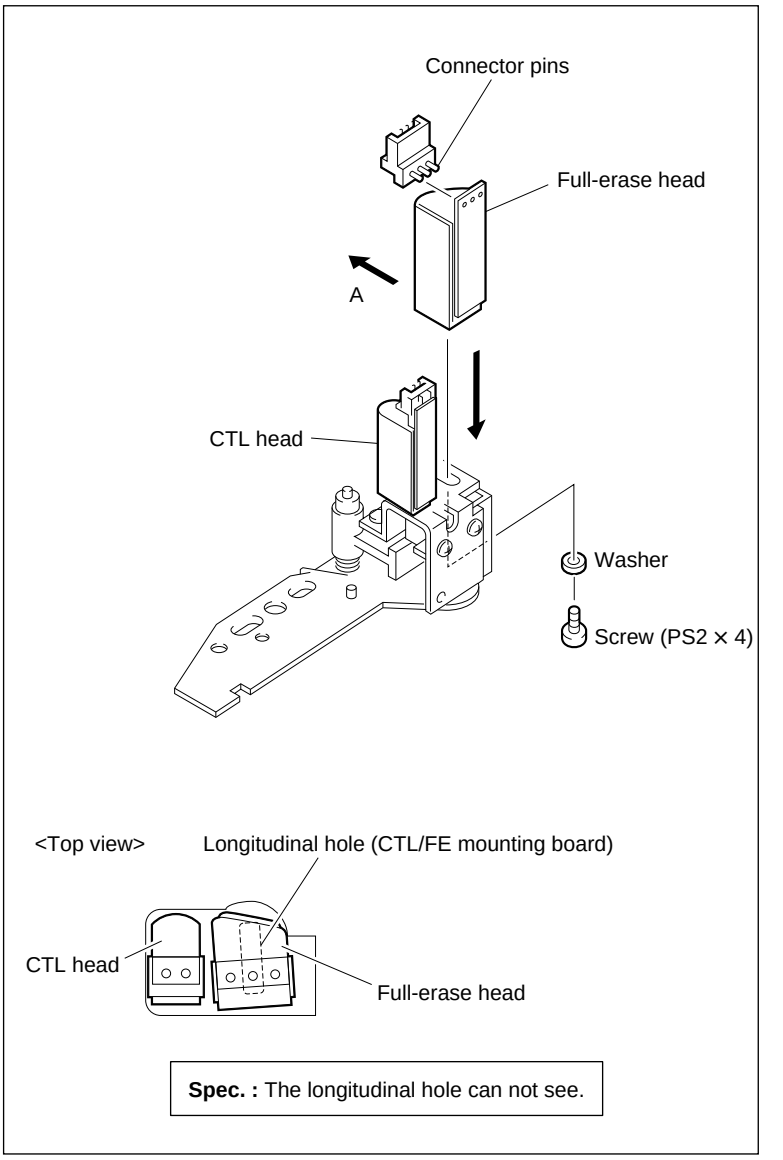
(2) Tighten the screw temporarily while moving the full-erase head in the direction indicated by arrow A.

Note

Be careful not to damage the full-erase head and CTL head.

(3) Confirm that the specification is satisfied and tighten the screw.

Tightening torque: 19.6×10^{-2} N・m
(2.0 kgf・cm)



Install the Full-erase Head

5. Install the CTL/FE Head Assembly

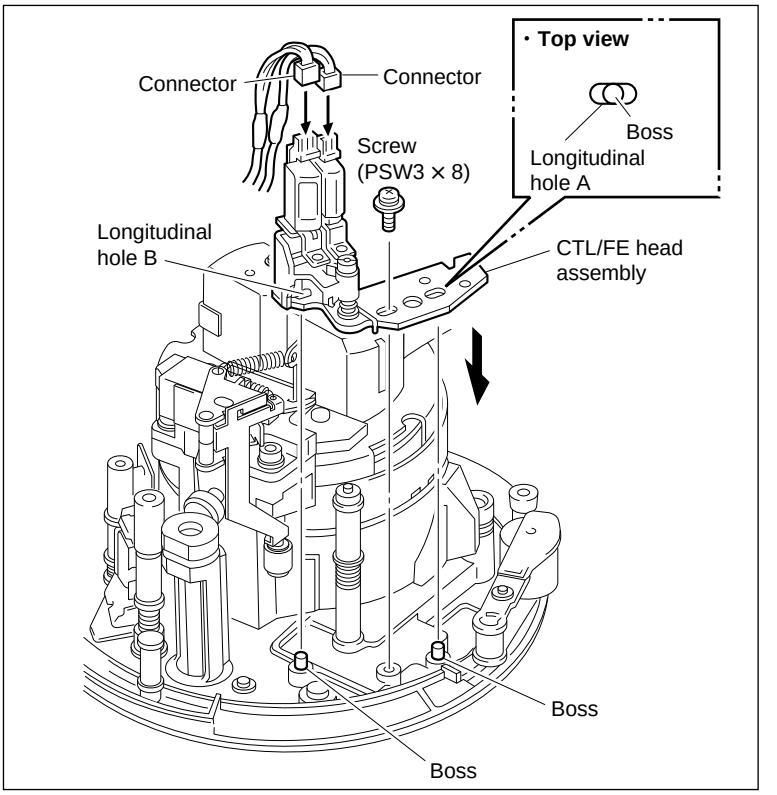
(1) Confirm that the threading ring is in the unthreading end state.

(2) Put longitudinal holes A and B of the CTL/FE head assembly into the bosses of the chassis.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.

(3) Place the boss of the chassis in the center of longitudinal hole A and tighten the screw.



Install the CTL/FE Head Assembly

6. Connect the Harness

Connect the harness to the connectors of the CTL head board and the full-erase head board.

7. Cleaning

Clean the surface of the CTL head and full-erase head with cleaning cloth moistened with cleaning fluid.
(Refer to Section 5-2-5 of the maintenance manual part1.)

Adjustment after Replacement

8. Adjust the Tape Running

Refer to Section 4-1-2.

9. Confirm the CTL Head Height

Refer to Section 4-1-4.

10. Adjust the CTL Head Position

Refer to Section 4-1-5.

11. Confirm the Tape Running

Refer to Section 4-1-2.

12. Confirm the AT Head Position

Refer to Section 4-1-9.

13. Adjust the Drum Phase

Refer to Section 5-2.

14. Confirm the Full-erase Current

Refer to Section 2.

15. Confirm the Full-erase Head's Erasure Ratio

Refer to Section 2.

3-9. AT Head Replacement

Outline

Replacement

1. Remove the CL Guide Rail
2. Disconnect the Connector
3. Remove the AT Head Assembly
4. Remove the AT Head
5. Install the AT Head
6. Install the AT Head Assembly
7. Connect the Connector
8. Install the CL Guide Rail
9. Cleaning (AT Head Surface)

Adjustment after Replacement

10. Adjust the AT Head Zenith (Refer to Section 4-1-1.)
11. Adjust the Tape Running (Refer to Section 4-1-2.)
12. Adjust the AT Head Height (Refer to Section 4-1-6.)
13. Adjust the AT Head Azimuth (Refer to Section 4-1-7.)
14. Adjust the AT Head Head-to-tape Contact (Refer to Section 4-1-8.)
15. Adjust the AT Head Position (Refer to Section 4-1-9.)
16. Confirm the Audio Level in REV Mode (Refer to Section 4-1-10.)
17. Confirm the Video Tracking (Refer to Section 4-1-3.)
18. Confirm the Tape Running (Refer to Section 4-1-2.)
19. Perform the Electrical Adjustment after AT Head Replacement (Refer to Section 5.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part 1.)

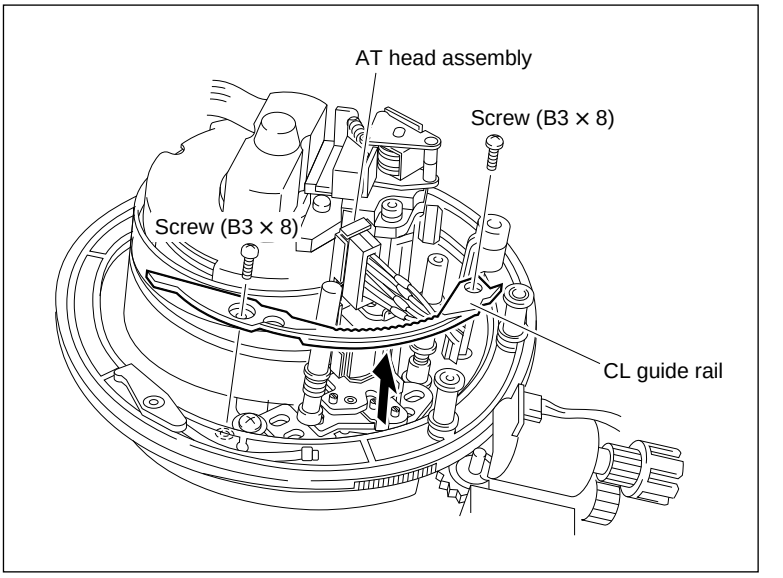
Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver+s bit (+2 mm, l = 75 mm) : J-6323-420-A

Removal

1. Remove the CL Guide Rail

Unscrew the two screws, and remove the CL guide rail.



Remove the CL Guide Rail

2. Disconnect the Connector

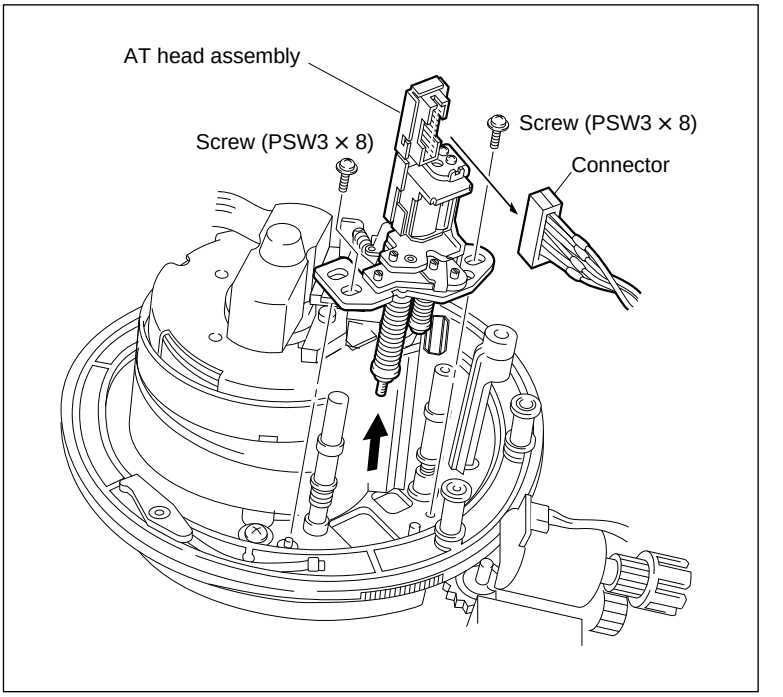
Disconnect a connector on the AT head board.

3. Remove the AT Head Assembly

Remove the two screws, then remove the AT head assembly from the unit.

CAUTION

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the AT Head Assembly

4. Remove the AT Head

(1) Remove the two screws, then remove the AT head and adjustment plate from the AT bracket.
(2) Remove the AT shield case.
(3) Remove the AT shield plate by opening the two claws using the long-nose plier.

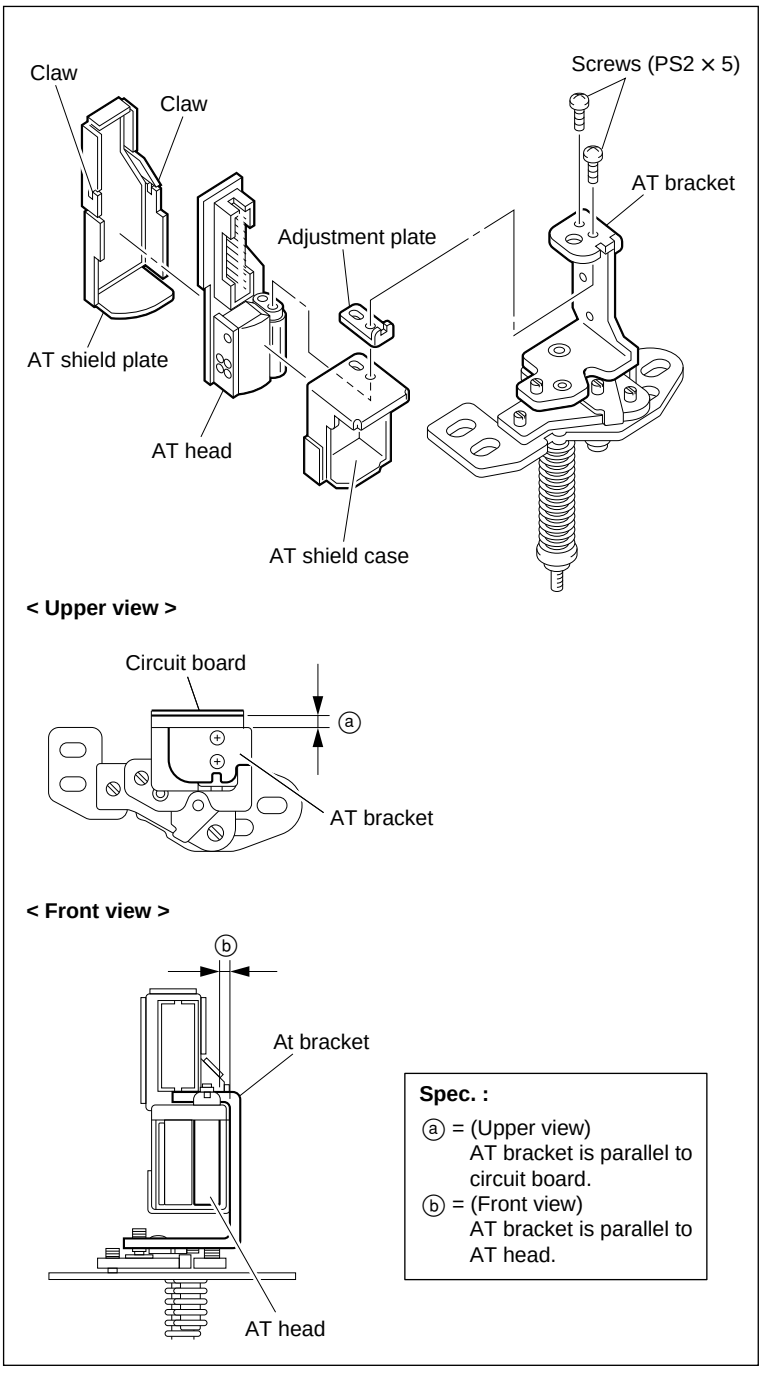
Installation

5. Install the AT Head

(1) Put a new head into the AT shield case and align the hole positions.
(2) Align the hole positions while putting the adjustment plate between the AT head and the AT bracket, then tighten the two screws tentatively.
(3) Tighten the screws after confirming that the specification is satisfied.

Tightening torque: 19.6×10^{-2} N • m
(2.0 kg • cm)

(4) Cover the AT shield plate on the AT head board.
Then, fix the AT shield plate by bending the two claws using the long-nose plier.



Remove/Install the AT Head

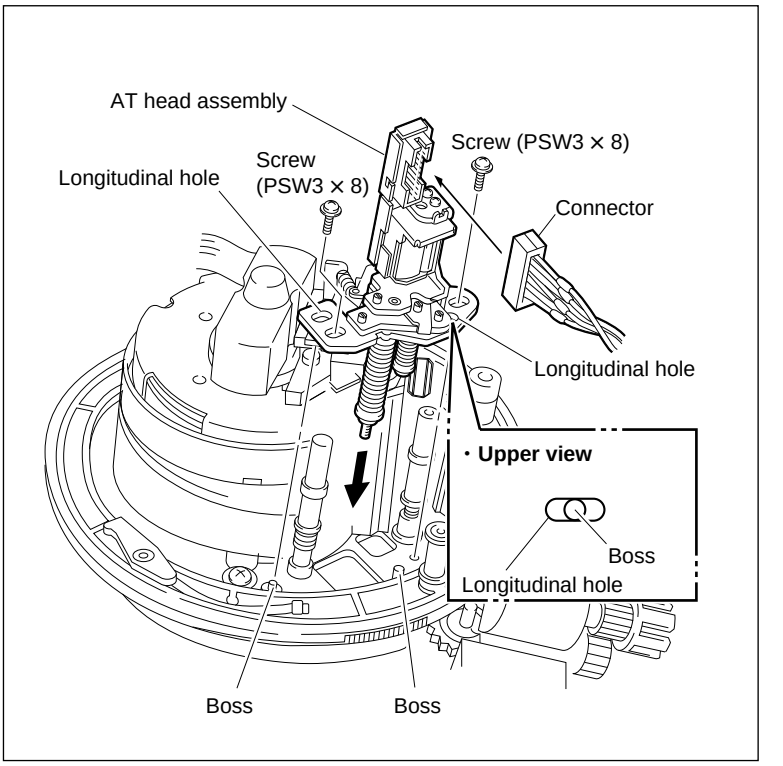
6. Install the AT Head Assembly

(1) Align the two longitudinal holes of the AT head assembly with the two bosses of the chassis.

CAUTION

- Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.
- Be careful not to damage the AT head surface.

(2) Align the bosses of the chassis with center of the longitudinal holes and tighten the two screws.



Install the AT Head Assembly

7. Connect the Connector

Connect a connector into the AT head board.

8. Install the CL Guide Rail

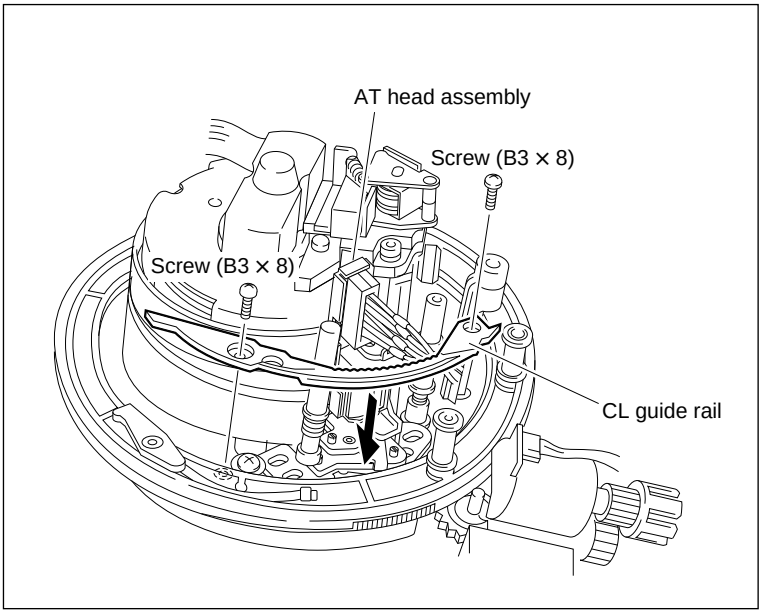
Install the CL guide rail using the two screws.

9. Cleaning

Clean the AT head surface with a cleaning cloth moistened with cleaning fluid.

CAUTION

After cleaning, wipe with a dry cleaning cloth.



Install the CL Guide Rail

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Adjustment after Replacement

10. Adjust the AT Head Zenith
Refer to Section 4-1-1.

11. Adjust the Tape Running
Refer to Section 4-1-2.

12. Adjust the AT Head Height
Refer to Section 4-1-6.

13. Adjust the AT Head Azimuth
Refer to Section 4-1-7.

14. Adjust the AT Head Head-to-tape Contact
Refer to Section 4-1-8.

15. Adjust the AT Head Position
Refer to Section 4-1-9.

16. Confirm the Audio Level in REV Mode
Refer to Section 4-1-10.

17. Confirm the Video Tracking
Refer to Section 4-1-3.

18. Confirm the Tape Running
Refer to Section 4-1-2.

19. Perform the Electrical Adjustment after AT Head Replacement
Refer to Section 5.

3-10. Pinch Roller Replacement

Replace the pinch roller every 2,000 hours of the tape running.

Outline

Replacement

1. Remove the Pinch Arm Assembly
2. Install the Pinch Arm Assembly
3. Adjust the Pinch Arm Assembly Vertical Play
4. Cleaning (Pinch Roller Surface)

Adjustment after Replacement

5. Confirm the Tape Running (Refer to Section 4-1-2.)
6. Confirm the AT Head Height (Refer to Section 4-1-6.)
7. Confirm the AT Head Azimuth (Refer to Section 4-1-7.)

Notes

1. When the pinch roller is damaged or worn, replace the pinch roller assembly.
2. When replacing the AT head cleaner, prepare a new stop washer.
   Stop washer(2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- Thickness gauge : 9-911-053-00
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Pinch Arm Assembly

(1) Remove the stop washer at the top of the pinch arm.

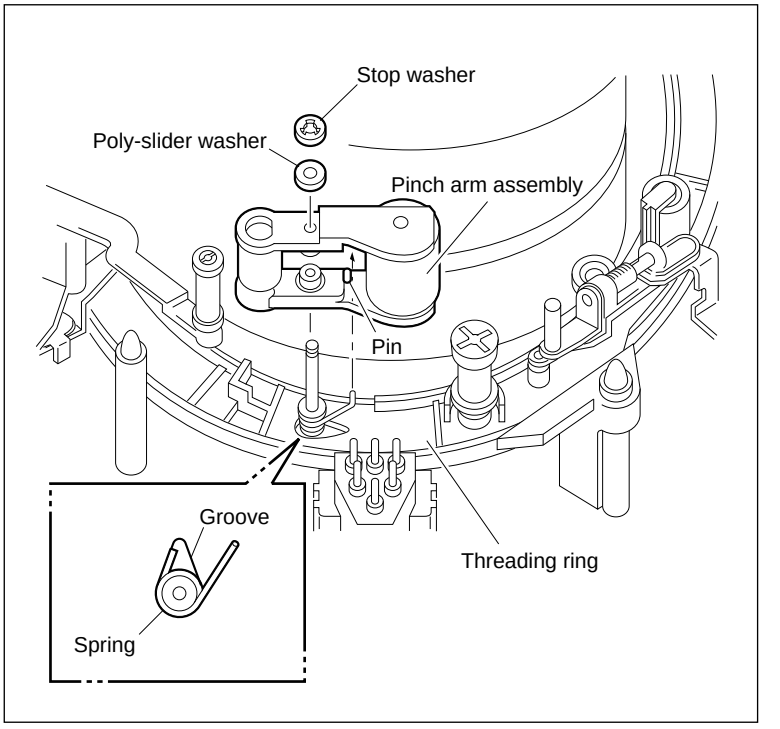
Note

If a poly-slider washer is inserted between the pinch arm assembly and the stop washer, be carefull not to lose the poly-slider washer. This poly-slider washer is used for vertical play adjustment.

(2) Remove the pinch arm assembly from the threading ring.

Note

Do not remove the poly-slider washer and spring at the bottom of the pinch arm assembly from the shaft.



Remove/Install the Pinch Arm Assembly

Installation

2. Install the Pinch Arm Assembly

(1) Pass a new pinch arm assembly through the shaft while hooking the spring as shown in the figure.

Notes

- Insert the short-end spring into the groove of the threading ring and hook the long-end spring to the side surface (drum side) of the pinch arm assembly.
- If the poly-slider washer was removed at the step 1, pass the same poly-slider washer through the shaft again.

(2) Fasten the pinch arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00

(3) Push the pinch arm assembly manually in the direction of the drum, then release. At that time, confirm that the pinch arm assembly smoothly returns to the former position.

3. Adjust the Pinch Arm Assembly Vertical Play

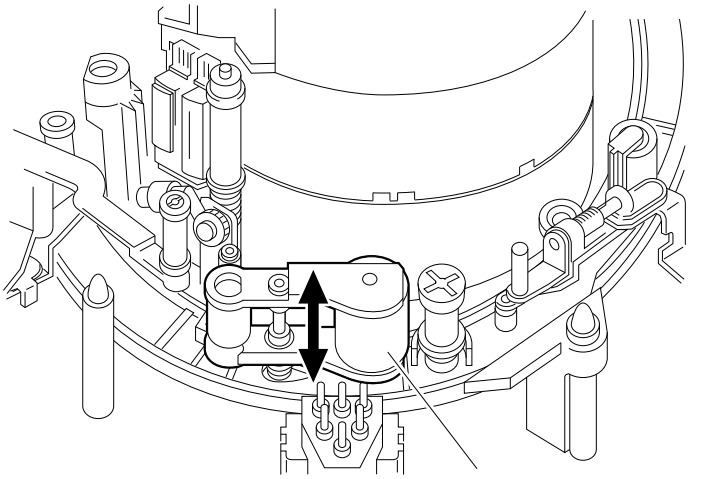
Move the pinch arm assembly in the vertical direction.
At this time, confirm that the vertical play satisfies the specification.

If the specification is not satisfied, perform the adjustment below.

(1) Remove the stop washer.
(2) Install or remove the poly-slider washer at the upper of the pinch arm.
(3) Fasten the pinch arm assembly by new stop washer, confirm again that the specification is satisfied.

4. Cleaning

Clean the pinch roller's cylindrical surface with a cleaning cloth moistened with cleaning fluid.



Spec. : Vertical play
0.05 mm to 0.2 mm

∗ When the specification is not satisfied.

• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11

Adjust the Pinch Arm Assembly Vertical Play

Adjustment after Replacement

5. Confirm the Tape Running

Refer to Section 4-1-2.

6. Confirm the AT Head Height

Refer to Section 4-1-6.

7. Confirm the AT Head Azimuth

Refer to Section 4-1-7.

3-11. Pinch Solenoid Replacement

Replace the pinch solenoid earlier time either 6,000 hours of tape running or 200,000 times of the threading.

3-11-1. Replacement Procedure of the Pinch Solenoid

Outline

Replacement

1. Disconnect the Connector (CN851 and CN854/PD-35 Board)
2. Remove the Pinch Press Assembly
3. Remove the PD-35 Board
4. Remove the Pinch Stopper
5. Remove the Pinch Solenoid
6. Install the Pinch Solenoid
7. Install the Pinch Stopper
8. Install the PD-35 Board
9. Install the Pinch Press Assembly
10. Connect the Connector (CN851 and CN854/PD-35 Board)

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C020: PINCH ROLLER)
12. Adjust the Pinch Press Clearance (Refer to Section 3-11-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

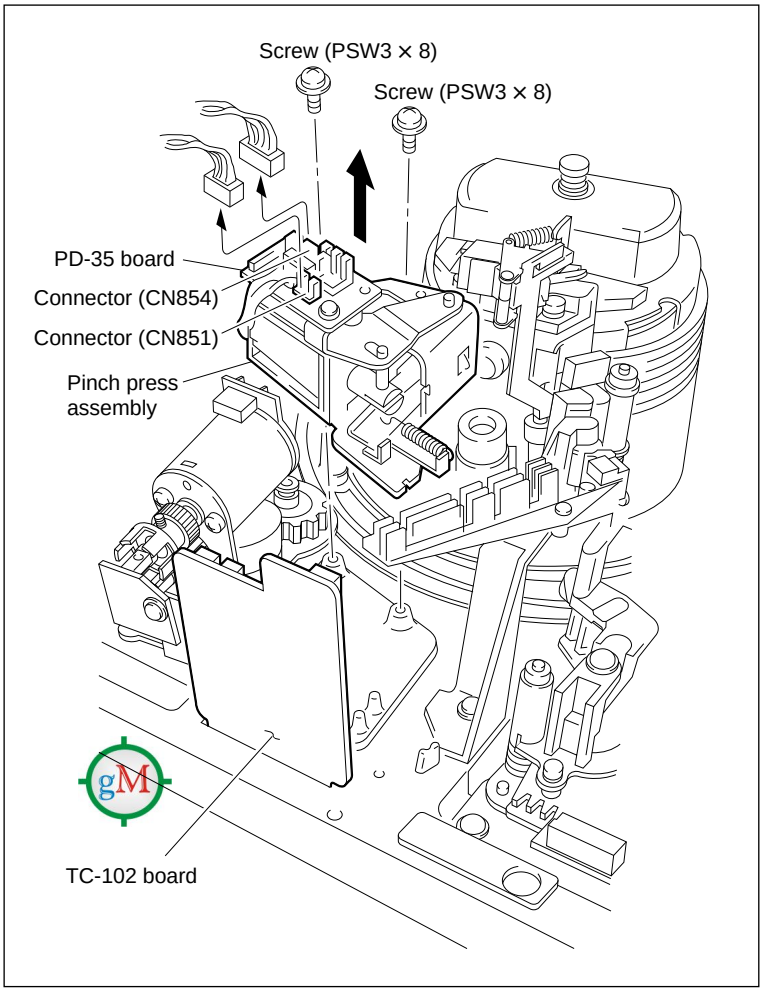
Removal

1. Disconnect the Connector

Disconnect the connectors CN851 and CN854 on the PD-35 board.

2. Remove the Pinch Press Assembly

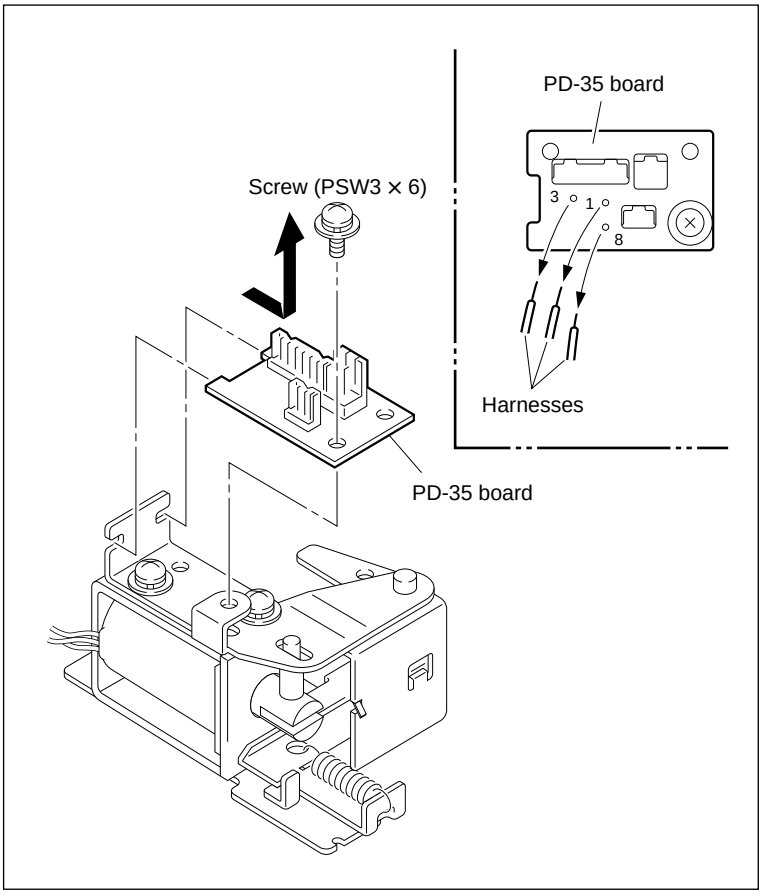
Remove the two screws, then remove the pinch press assembly from the unit.



Remove the Pinch Press Assembly

3. Remove the PD-35 Board

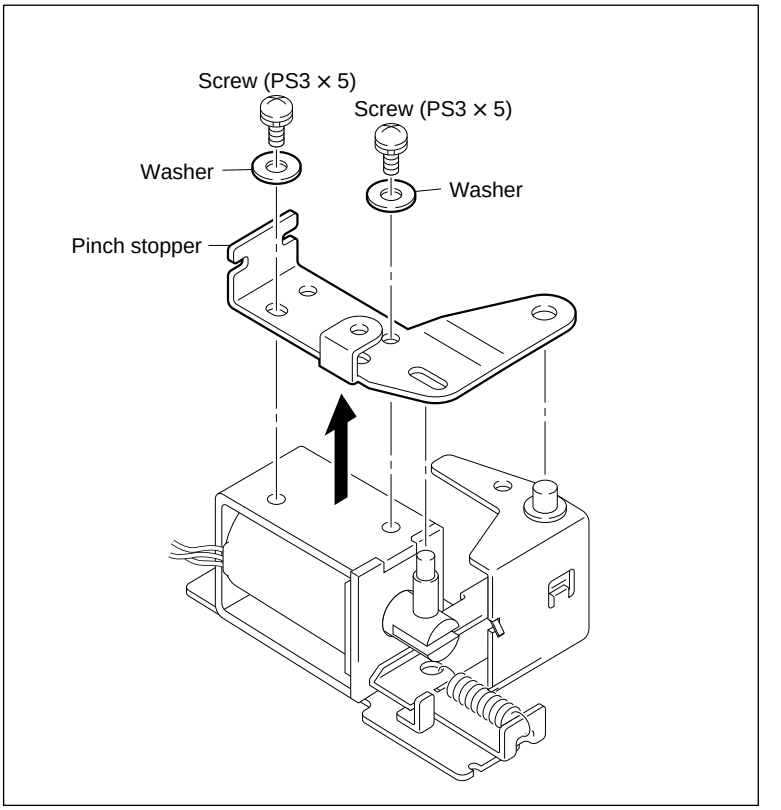
(1) Remove the screw, then remove the PD-35 board from the pinch press assembly.
(2) Unsolder the three harness soldered on the PD-35 board.



Remove the PD-35 Board

4. Remove the Pinch Stopper

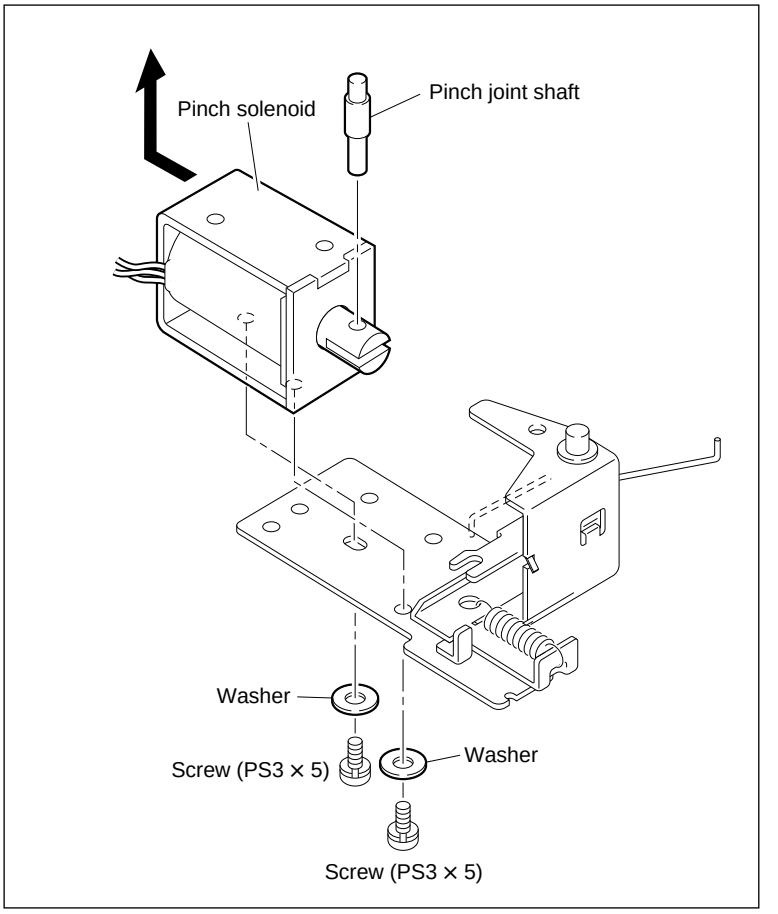
Remove the two screws and washers, then remove the Pinch stopper.



Remove the Pinch Stopper

5. Remove the Pinch Solenoid

(1) Extract the Pinch joint shaft.
(2) Remove the two screws and washers, then remove the pinch solenoid.



Remove the Pinch Solenoid

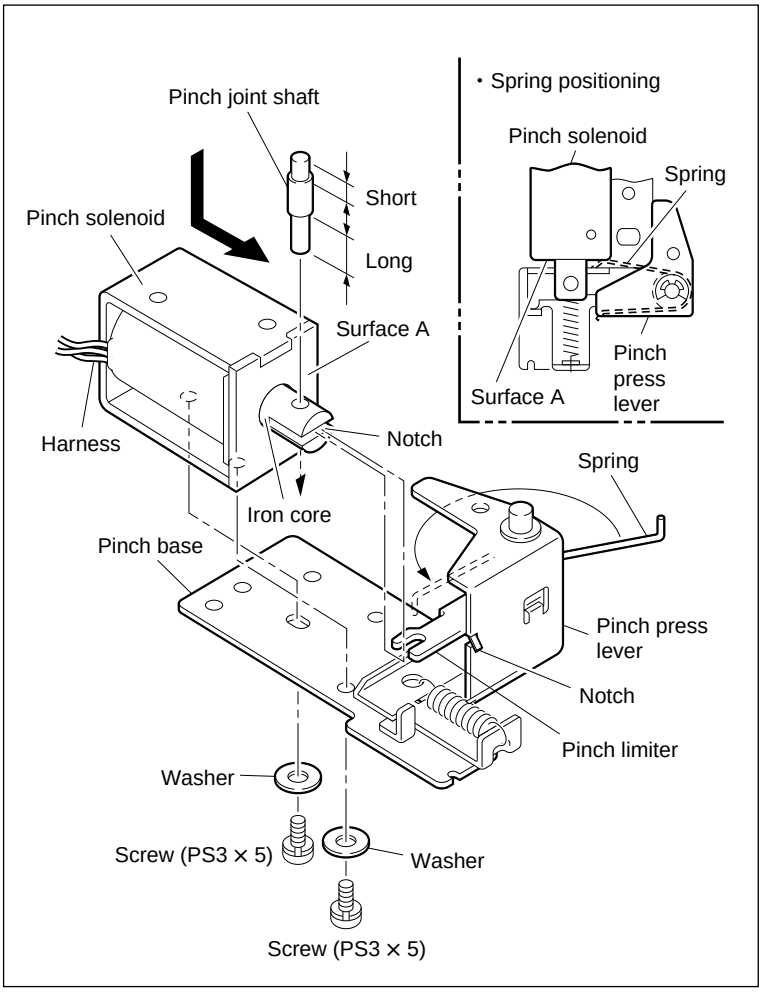
Installation

6. Install the Pinch Solenoid

(1) Install a new solenoid to the Pinch base in the direction shown in the figure.
(2) Bend the spring in the direction indicated by the arrow and bring it into contact with surface A of the solenoid shown in the figure.
(3) Put the pinch limiter into the notch of the solenoid's iron core and pass the pinch joint shaft through the hole of the iron core in the direction shown in the figure.
(4) Put the two washers and tighten the two screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

(5) Confirm that the other end of the spring is put on the notch of the pinch press lever.



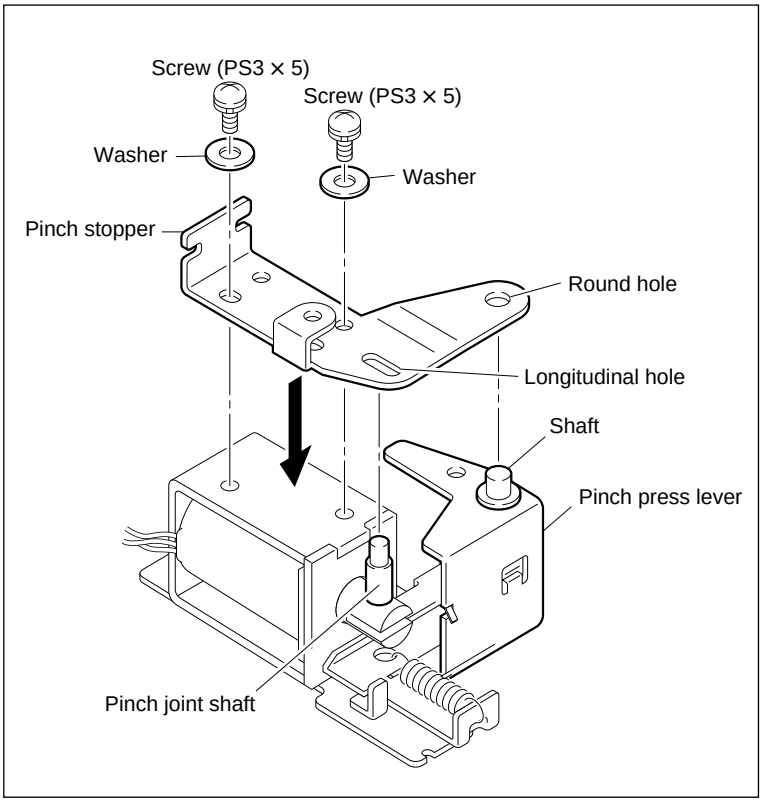
Install the Pinch Solenoid

7. Install the Pinch Stopper

(1) Pass the longitudinal hole of the pinch stopper to the pinch joint shaft, then pass the round hole to the shaft of the Pinch press lever.

(2) Put the washers and tighten the screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)



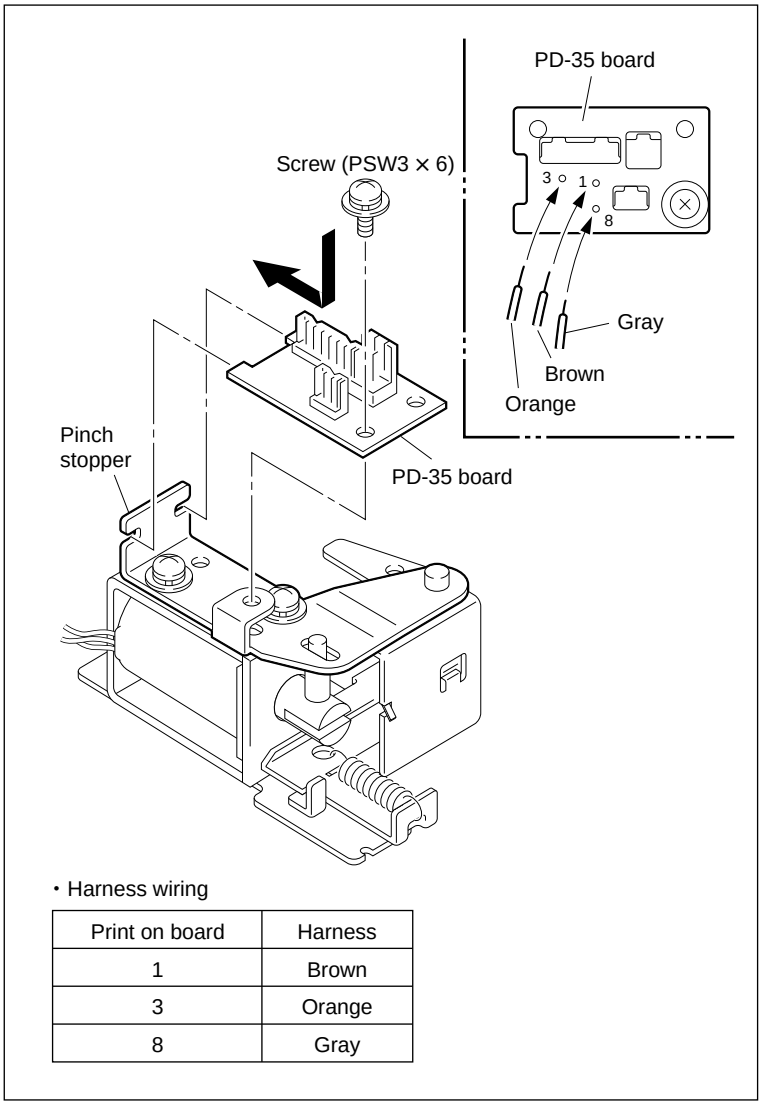
Install the Pinch Stopper

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8. Install the PD-35 Board

(1) Wire the harness to the PD-35 board as shown in the figure, then solder.

(2) Insert the PD-35 board into the pinch stopper and tighten the screw.



• Harness wiring

Print on board	Harness
1	Brown
3	Orange
8	Gray

Install the PD-35 Board

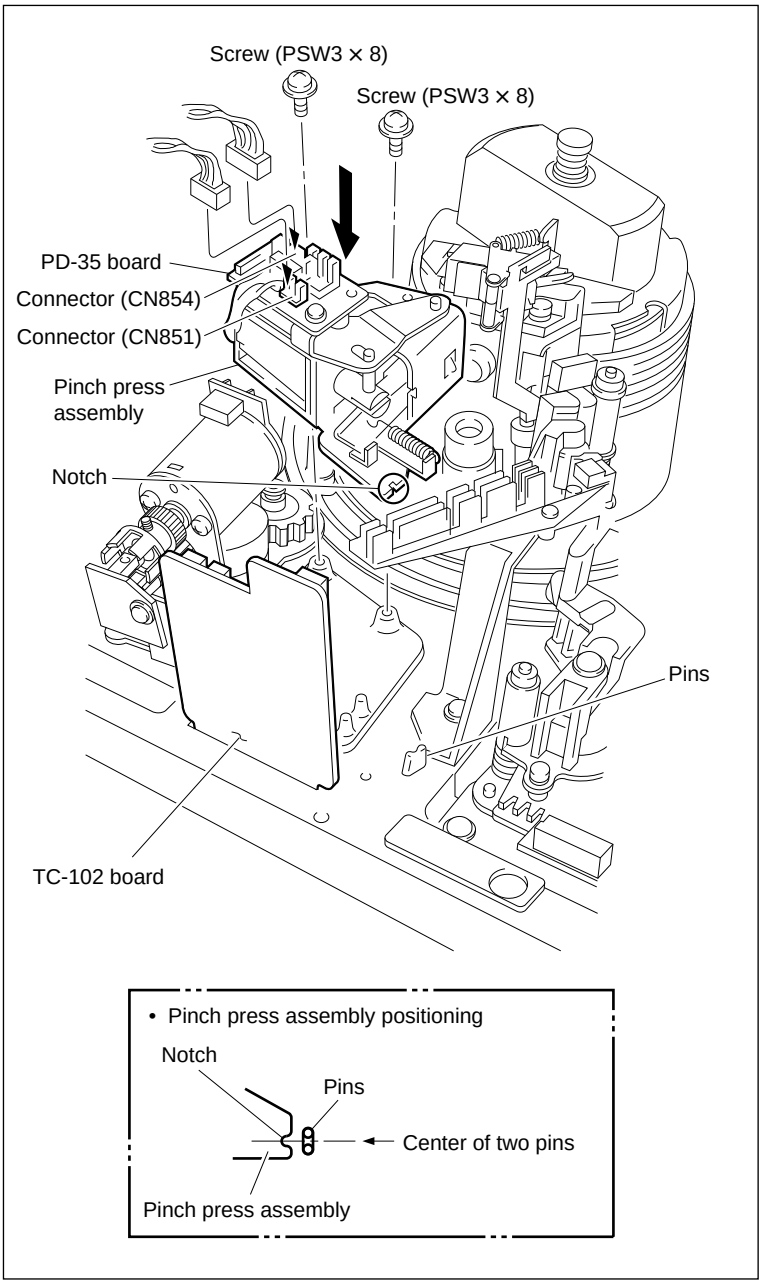
9. Install the Pinch Press Assembly

Align the notch of the pinch press assembly with the center of the two pins and tighten the two screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

10. Connect the Connector

Connect the harnesses into the connectors CN851 and CN854 on the PD-35 board.



Install the Pinch Press Assembly

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C020: PINCH ROLLER)

12. Adjust the Pinch Press Clearance

Refer to Section 3-11-2.

3-11-2. Pinch Press Clearance Adjustment

Note

- Be sure to check the clearance at pinch press is energized state when the pinch press assembly is removed.

Tool

- Wire clearance check gauge set: J-6152-450-A

Check

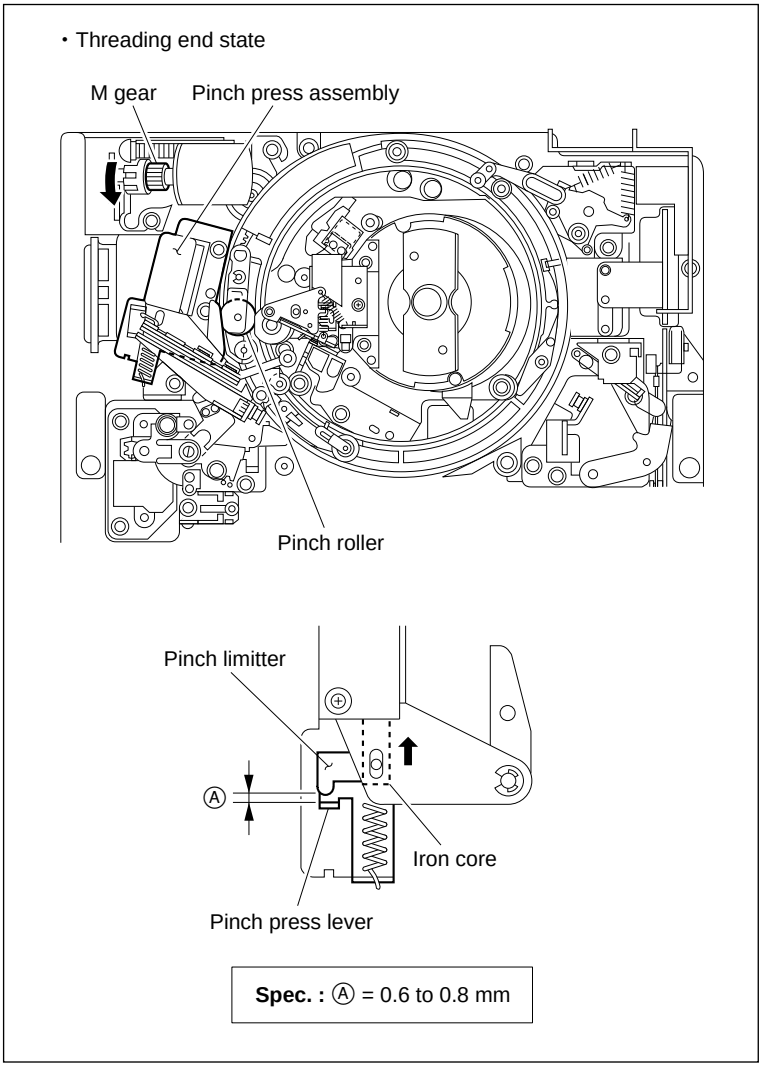
1. Put the Pinch Solenoid into the Energized State

(1) Turn the M gear of the gear box assembly manually, and put the unit into the threading end mode.
(2) Press the iron core of the pinch solenoid in the direction of the fully energized state.

2. Check the Pinch Press Clearance

Check that the clearance between the pinch limiter and pinch press lever satisfies the specification.

If the specification is not satisfied, perform steps 3 and later.



Pinch Press Clearance Check

Adjustment

3. Loosen the Screws

Loosen the two screws securing the pinch press assembly by 1/2 to one turn.

4. Adjust the Pinch Press Assembly Position

Put the pinch solenoid into the energized state, then insert the tip of a 3 mm flat-blade screwdriver into the notch of the pinch press assembly and adjust the pinch press assembly position so that the specification is satisfied.

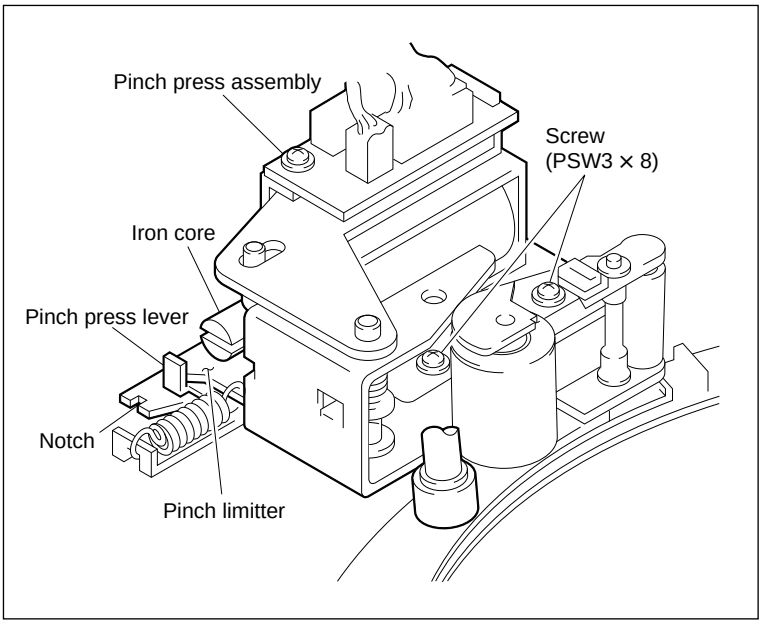
5. Tighten the Screws

Tighten the two screws loosened in step 3.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

6. Recheck the Pinch Press Clearance

Refer to steps 1 and 2.



Adjust the Pinch Press Clearance

3-12. Capstan Motor Replacement

Replace the capstan motor every 6,000 hours of tape running.

Outline

Replacement

1. Remove the Shield Plate (Bottom)
2. Remove the DT-34D Board
3. Remove the DR-315 Board
4. Remove the Video Head Cleaner Assembly
5. Remove the Demagnetization Head Assembly
6. Remove the Capstan Motor
7. Install the Capstan Motor
8. Install the DR-315 Board
9. Install the DT-34D Board
10. Install the Shield Plate (Bottom)
11. Install the Demagnetization Head Assembly
12. Install the Video Head Cleaner Assembly
13. Cleaning (Capstan Motor Shaft)

Adjustment after Replacement

14. Confirm the Pinch Press Clearance (Refer to Section 3-11-2.)
15. Confirm the Tape Running (Refer to Section 4-1-2.)
16. Perform the Capstan Motor Operation Check (Refer to Section 4-2 of the maintenance manual part 1.) (C014: CAPSTAN MOTOR)
17. Perform the Capstan FG Duty Adjust (Refer to Section 4-2 of the maintenance manual part 1.) (A003: CAPSTAN FG DUTY)
18. Perform the Capstan Free Speed Adjust (Refer to Section 4-2 of the maintenance manual part 1.) (A010: CAPSTAN SPEED)
19. Perform the Adjusted Data Save (Refer to Section 4-2 of the maintenance manual part 1.) (A012: NV-RAM CONTROL)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4-2 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)
5. Remove the bottom plate with the right side panel of the unit down.
   (Refer to Section 2-3-1 of the maintenance manual part 1.)

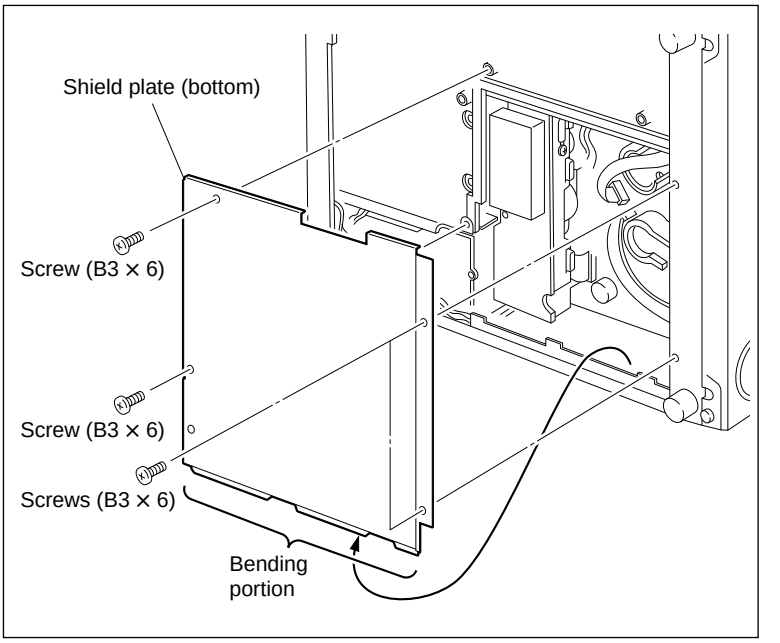
Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- L shaped hex. wrench (d = 2.5 mm) : 7-700-736-04

Removal

1. Remove the Shield Plate (Bottom)

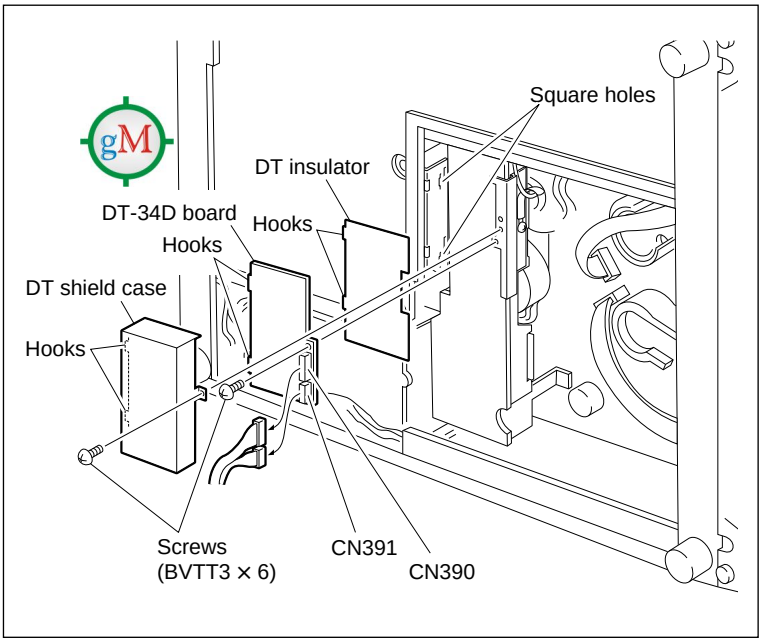
Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

2. Remove the DT-34D Board

(1) Remove a screw, remove the two hooks from the square holes of the chassis, and then remove the DT shield case.
(2) Disconnect the harnesses from connectors CN390 and CN391 on the DT-34D board.
(3) Remove a screw, remove the two hooks from the square holes of the chassis, and then remove the DT-34D board and DT insulator.



Remove the DT-34D Board

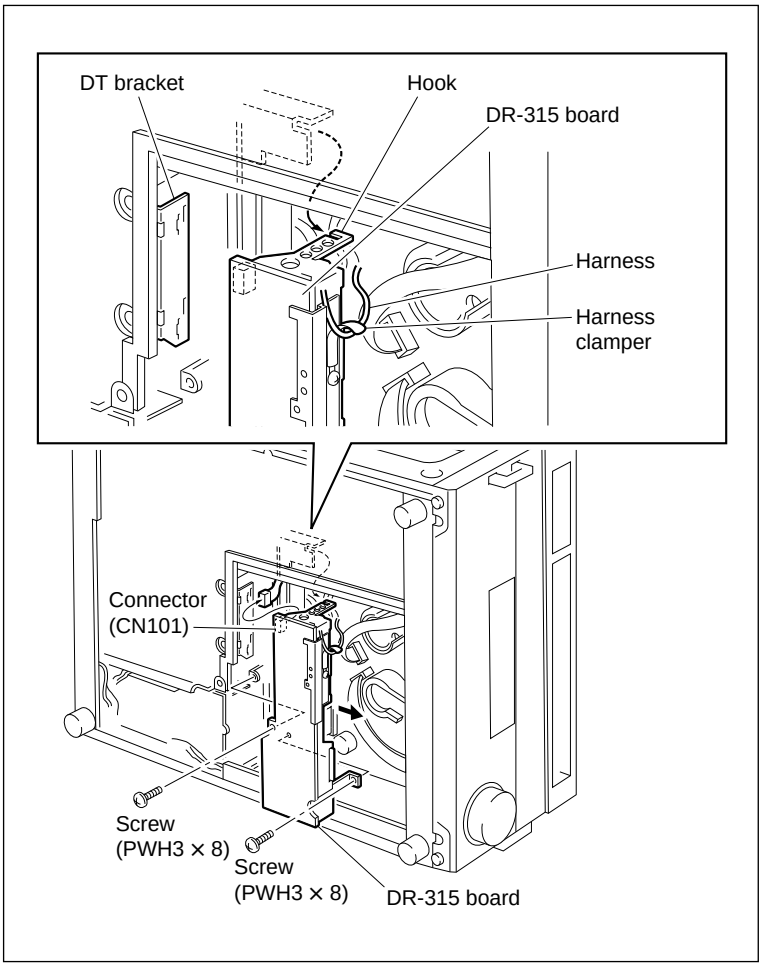
3. Remove the DR-315 Board

(1) Open the harness clamper on the DR-315 board and release the bundled harness.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board in the direction of the reel table by about 1 cm and remove the hook.

Note

The hook is difficult to view because it is located in the inner part.

(4) Disconnect the harness from connector CN101 on the DR-315 board.
(5) Move the DR-315 board in the direction indicated by the arrow until the capstan motor is viewed.



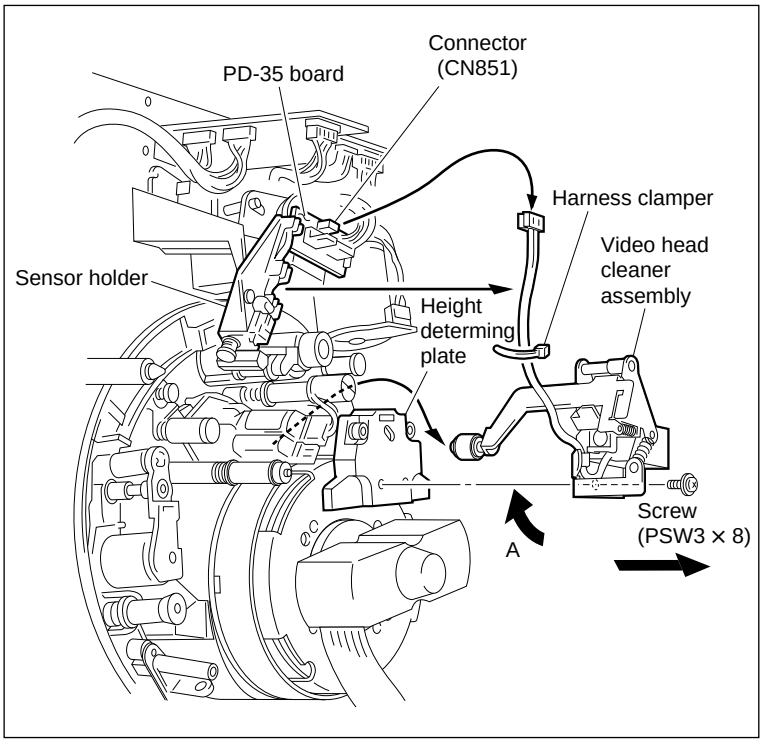
Remove the DR-315 Board

4. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

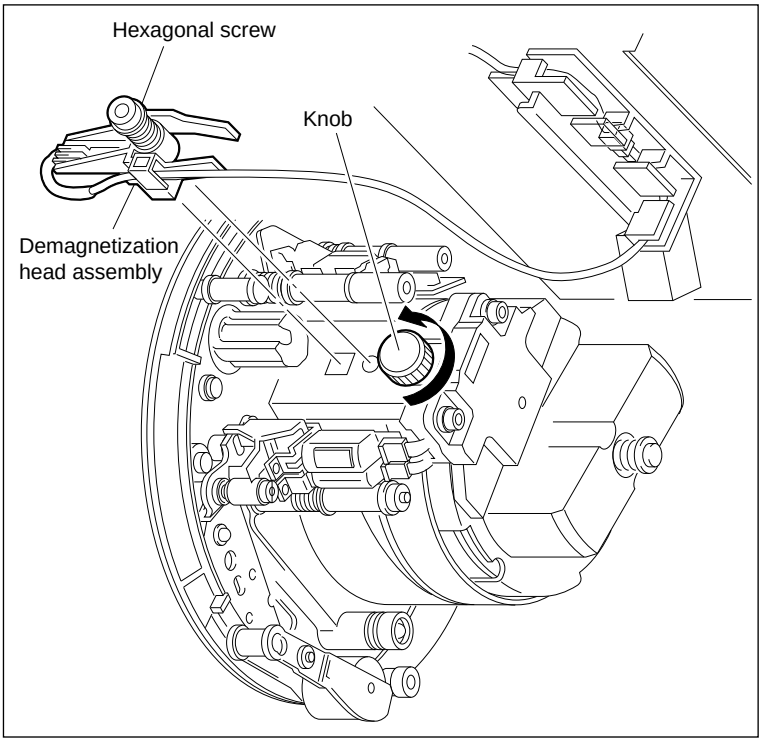
To remove the securing screws of the capstan motor, remove the video head cleaner assembly.



Remove the Video Head Cleaner Assembly

5. Remove the Demagnetization Head Assembly

(1) Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.
(2) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.



Remove the Demagnetization Head Assembly

6. Remove the Capstan Motor

(1) Disconnect the connector on the capstan motor board.

(2) Remove the two screws while holding the capstan motor by hand.

CAUTION

Be carefull not to fall the removed screw in the unit.

Installation

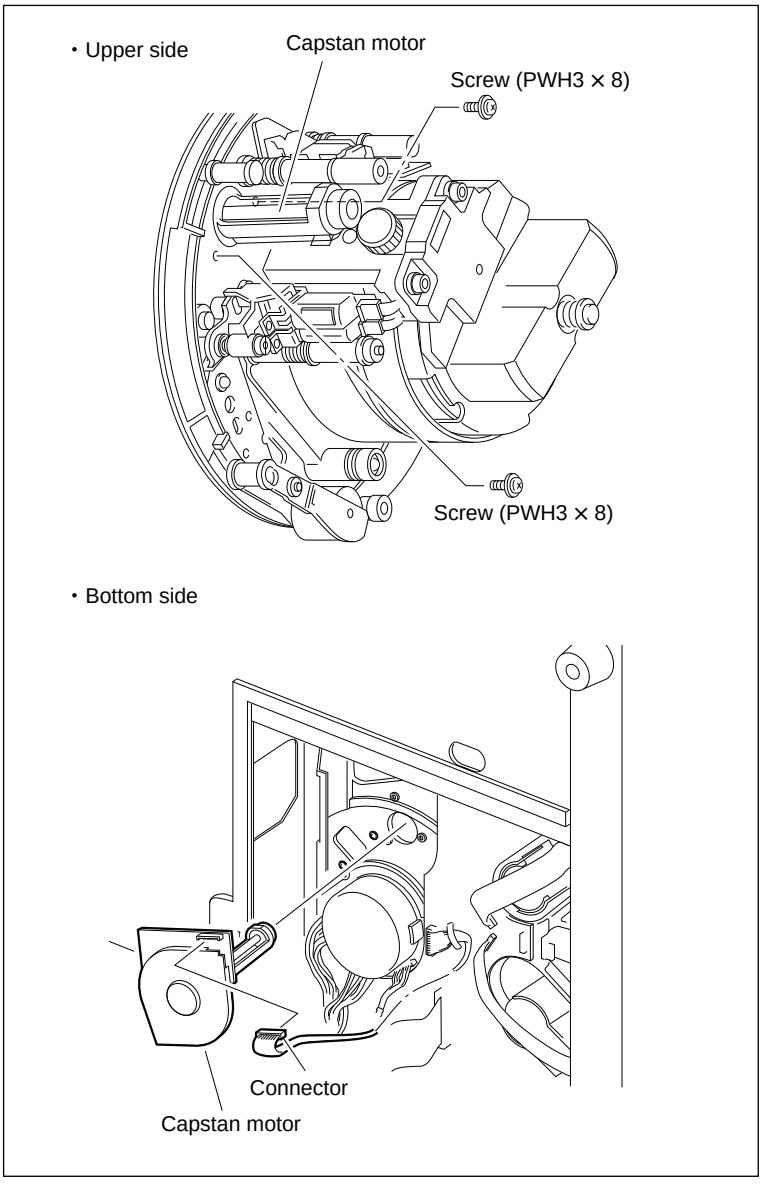
7. Install the Capstan Motor

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten the two screws.

CAUTION

- Be careful not to drop the capstan motor.
- Be careful not to damage the capstan motor shaft when passing the capstan motor through the hole of the chassis.

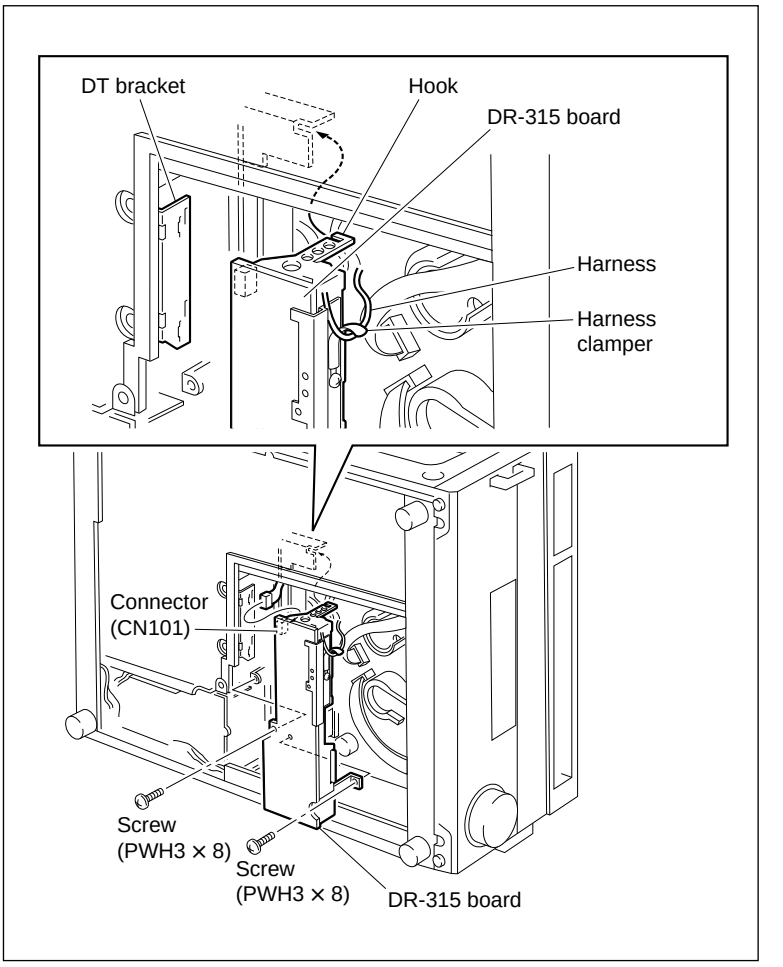
(2) Connect the connector disconnected in (1) of step 6 to the capstan motor board.



Remove/Install the Capstan Motor

8. Install the DR-315 Board

(1) Connect a connector to the connector CN101 on the DR-315 board.
(2) Put the hook on the DR-315 board into the groove of the chassis.
(3) Tighten the DR-315 board with two screws.
(4) Fix the harness released in step (1) of procedure 3 using a harness clamper.

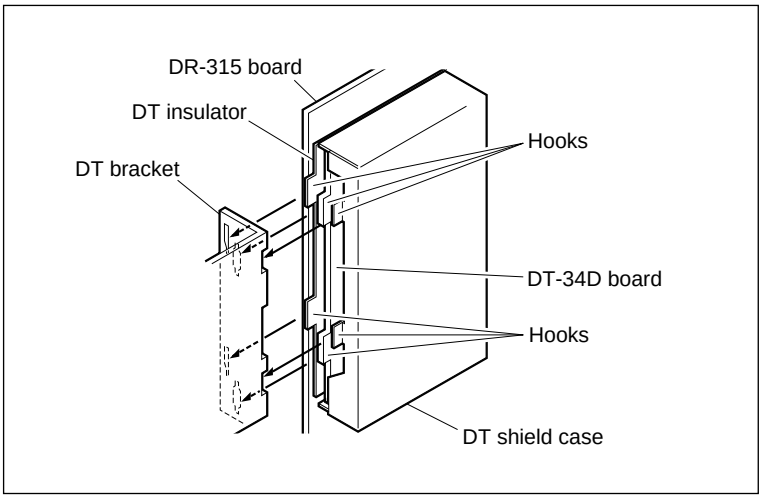


Install the DR-315 Board

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9. Install the DT-34D Board

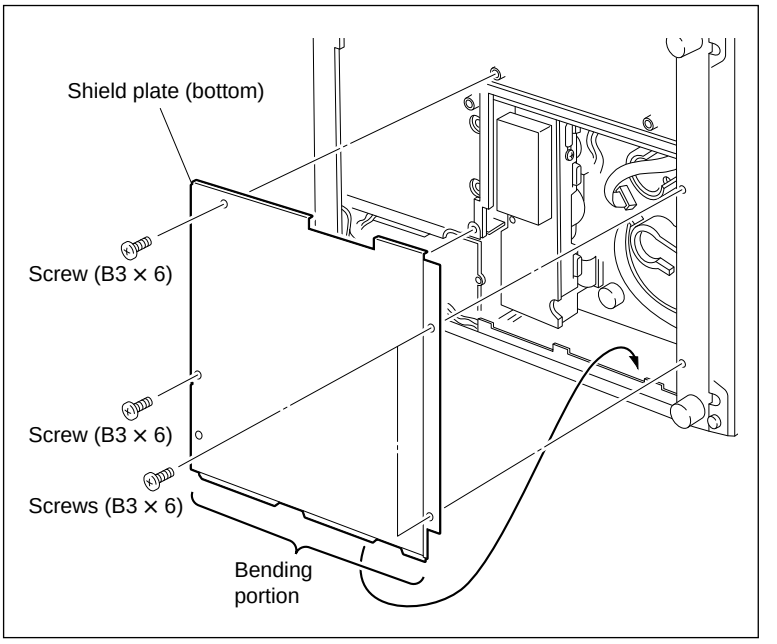
Install the DT-34D board in the reverse order of steps (1) to (3) of procedure 2.
Insert the two hooks of the DT insulator, DT-34D board, and DT shield case into the square holes of the DT bracket.



Install the DT-34D Board

10. Install the Shield Plate (Bottom)

Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

11. Install the Demagnetization Head Assembly

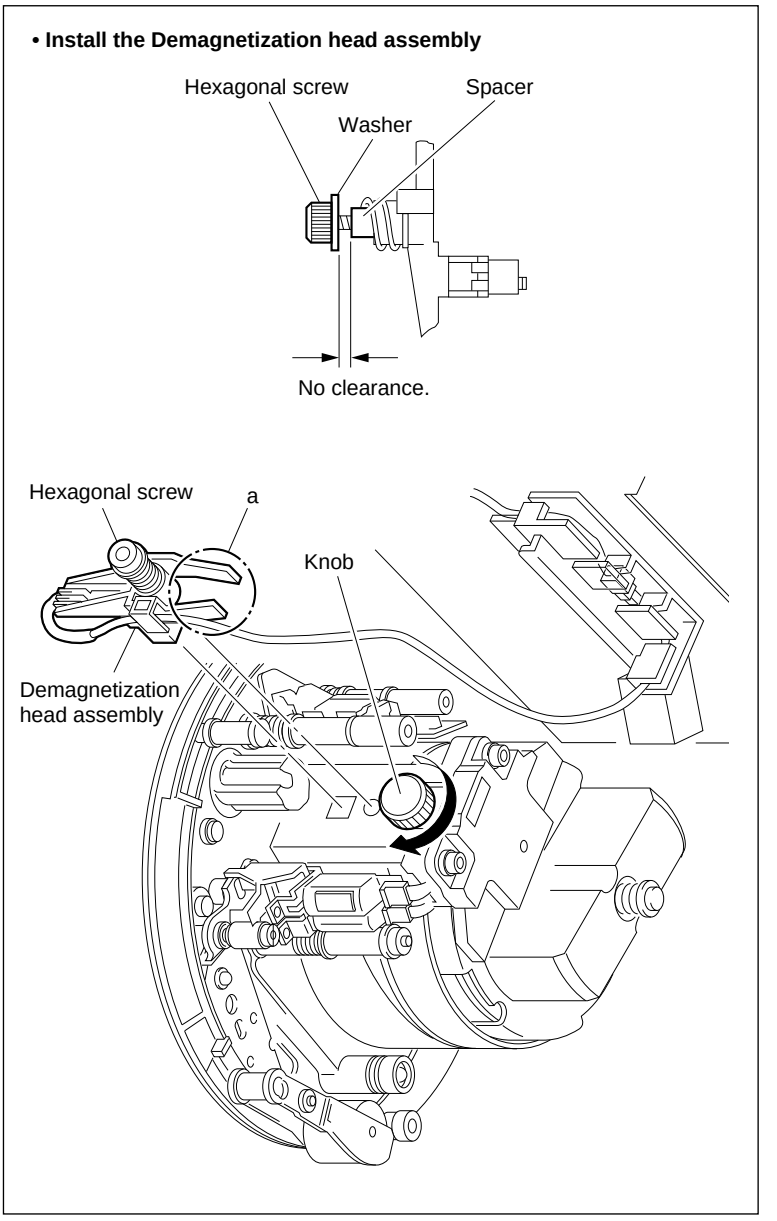
(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

Tightening torque: 39.2×10^{-2} N•m
(4 kgf • cm)

Note

Put portion “a” of the demagnetization head assembly under the knob.

(2) Turn the knob of the demagnetization head clockwise with fingers and tighten the knob as far as it will go.



Install the Demagnetization Head Assembly

12. Install the Video Head Cleaner Assembly

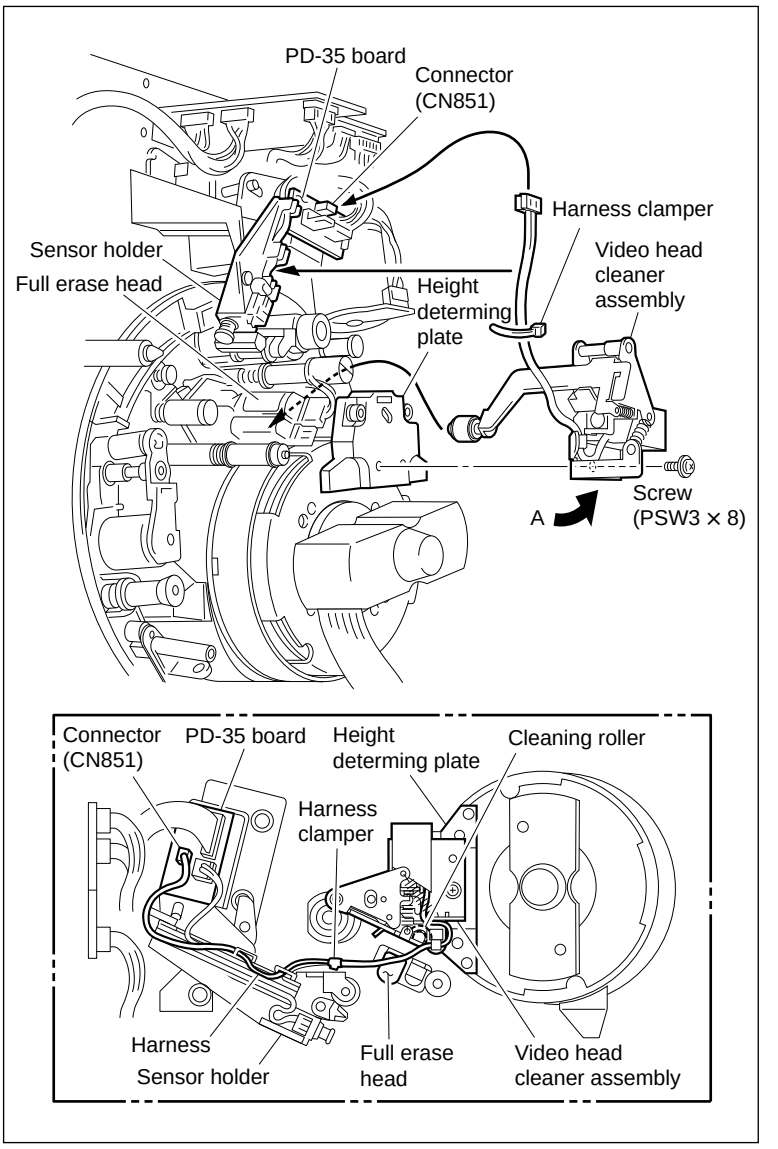
(1) Insert the cleaning roller into the clearance between the height determing plate and full erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the full erase head harness and the video head cleaner harness with the harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to Section 3-5, step5.)

13. Cleaning

Clean the capstan motor shaft with a cleaning cloth moistened with cleaning fluid.

CAUTION

After cleaning, wipe with a dry cleaning cloth.



Install the Video Head Cleaner Assembly

Adjustment after Replacement

14. Confirm the Pinch Press Clearance

Refer to Section 3-11-2.

15. Confirm the Tape Running

Refer to Section 4-1-2.

16. Perform the Capstan Motor Operation Check

Refer to Section 4-2 of the maintenance manual part 1. (C014: CAPSTAN MOTOR)

17. Perform the Capstan FG Duty Adjust

Refer to Section 4-2 of the maintenance manual part 1. (A003: CAPSTAN FG DUTY)

18. Perform the Capstan Free Speed Adjust

Refer to Section 4-2 of the maintenance manual part 1. (A010: CAPSTAN SPEED)

19. Perform the Adjusted Data Save

Refer to Section Section 4-2 of the maintenance manual part 1. (A012: NV-RAM CONTROL)

3-13. Reel Table Assembly Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Install the Reel Table Assembly

Adjustment after replacement

3. Confirm the Reel Table Height (Refer to Section 3-13-1.)
4. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
5. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
6. Confirm the Reel Rotation Sensor Position (Refer to Section 3-13-4.)
7. Reel FG Duty Adjustment (Refer to Section 4-2 of the maintenance manual part 1.)
   (A001: S REEL FG DUTY/A002: T REEL FG DUTY)

Note

The reel table assembly replacement is the same on the supply (S) and take-up (T) sides.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

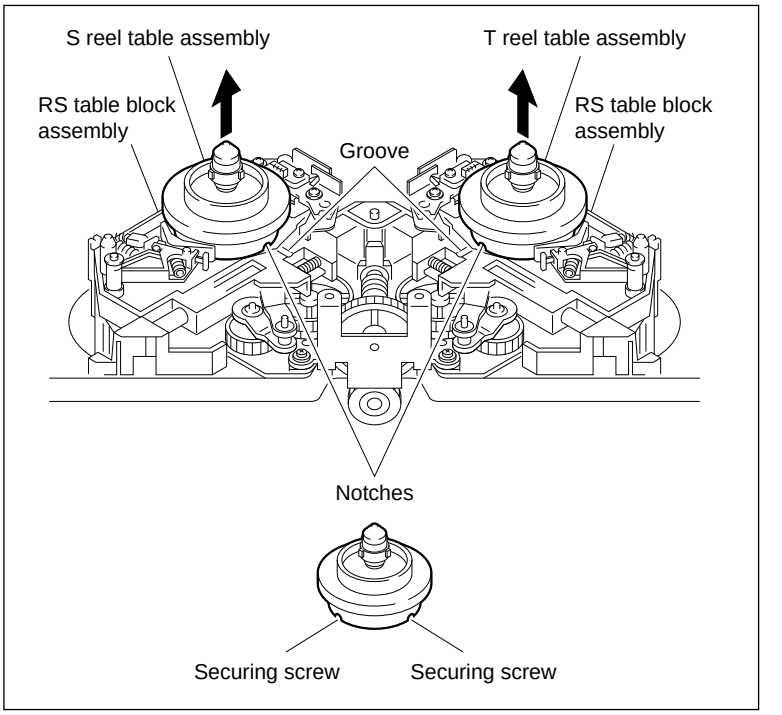
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

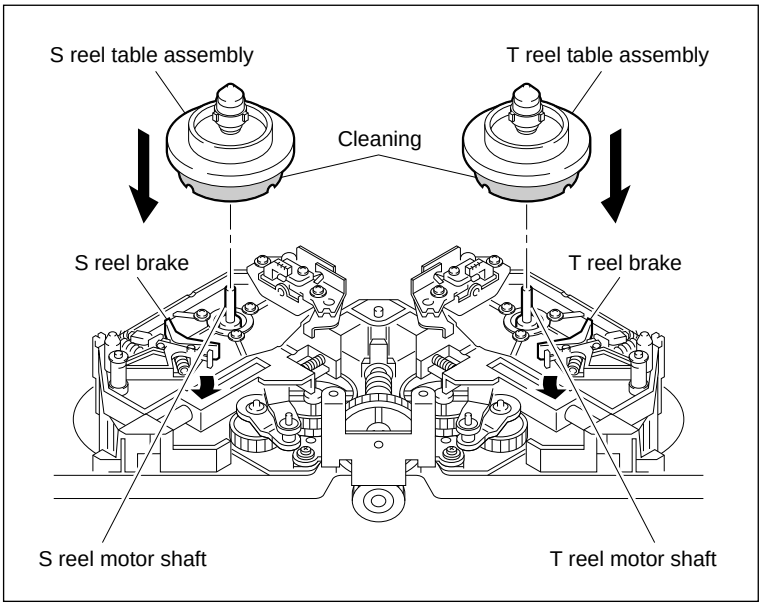
Installation

2. Install the Reel Table Assembly

(1) Clean the circumference of a new reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Reel Table Assembly Installation

Adjustment after Replacement

3. Confirm the Reel Table Height

Refer to Section 3-13-1.

4. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

5. Confirm the Reel Brake Release Amount

Refer to Section 3-13-3.

6. Confirm the Reel Rotation Sensor Position

Refer to Section 3-13-4.

7. Reel FG Duty Adjustment

Refer to Section 4-2 of the maintenance manual part 1.
(A001: S REEL FG DUTY/
A002: T REEL FG DUTY)

3-13-1. Reel Table Height Adjustment

Notes

- Be sure to check the height of the reel table when a reel table is removed or when it is replaced.
- Perform the reel table height adjustment correctly.
  The height of the reel table is used as the reference for the tape path.
- After the supply reel table height adjustment is performed, be sure to check the video tracking. (Refer to Section 4-1-3.)

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel table height gauge (MW-935) : J-6329-350-A
- L-shaped wrench (1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the RS Table Block Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Take-up Reel Table Height

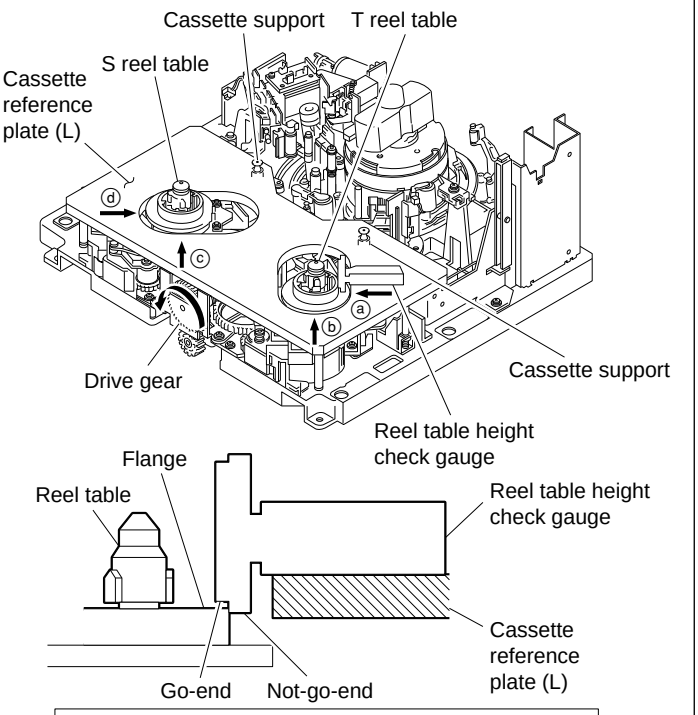
(1) Press the "T"-stamped side of the gauge against the take-up reel table from the direction indicated by the arrow ⓐ.
(2) Check that the specification is satisfied while rotating the take-up reel table clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓑ in the same way.

4. Check the Supply Reel Table Height

(1) Press the "S"-stamped side of the gauge against the supply reel table from the direction indicated by the arrow ⓒ.
(2) Check that the specification is satisfied while rotating the supply reel table counter-clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓓ in the same way.

If the specification is not satisfied in steps 3 and 4, perform steps 7 and 8.

< L cassette position >



Spec. : The go-end of the gauge slide over the flange of the reel table.
The not-go-end of the gauge does not slide over.

Check the Reel Table Height (L)

5. Place the Reel Shift Plate Assembly in the S Cassette Position

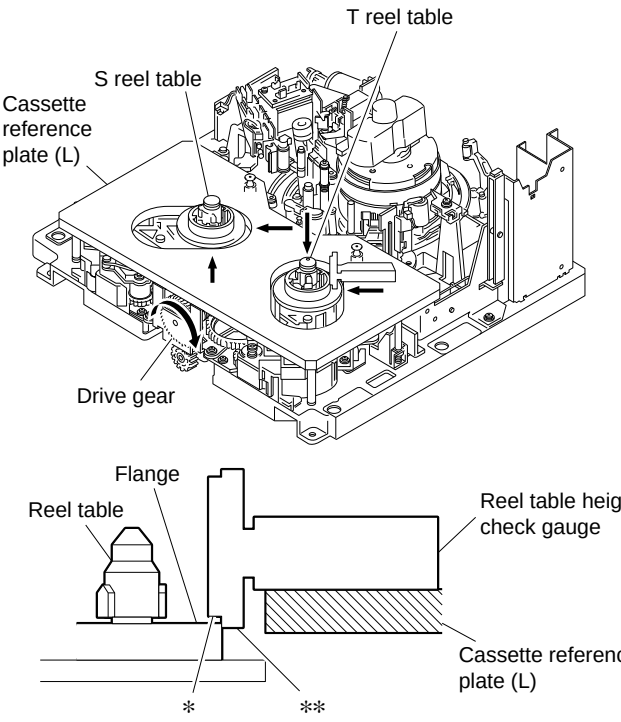
Rotate the drive gear clockwise as far as it will go.

6. Check the Supply and Take-up Reel Table Height

Perform in the same way as in steps 3 and 4.

If the specification is not satisfied, perform steps 7 and later.
If the specifications are satisfied in both the L and S cassette positions, perform steps 9 and later.

< S cassette position >



Spec. : The * marked portion of the gauge slide over the flange of the reel table.
The ** marked portion of the gauge does not slide over.

Check the Reel Table Height (S)

Adjustment

7. Remove the Reel Table

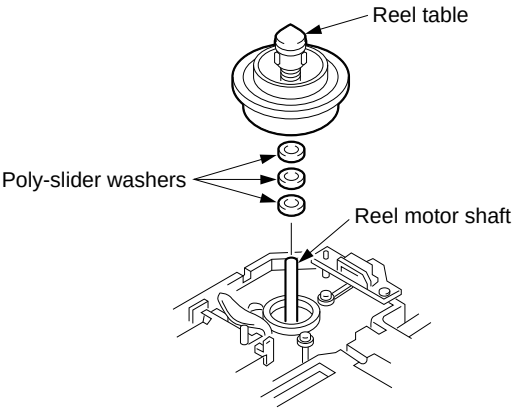
Refer to step 1 in Section 3-13.

8. Adjust the Number of Poly-slider Washers

Adjust the number of poly-slider washers installed in the reel motor shaft so that the specifications are satisfied in both the L and S cassette positions.

9. Remove the Cassette Reference Plate (L)

Remove the cassette reference plate (L) and reel table height gauge.



・Poly-slider washer for adjustment

Diameter	Thickness	Part No.
4 mm	0.05 mm	3-188-108-01
	0.13 mm	3-701-441-01
	0.25 mm	3-701-441-11
	0.5 mm	3-701-441-21

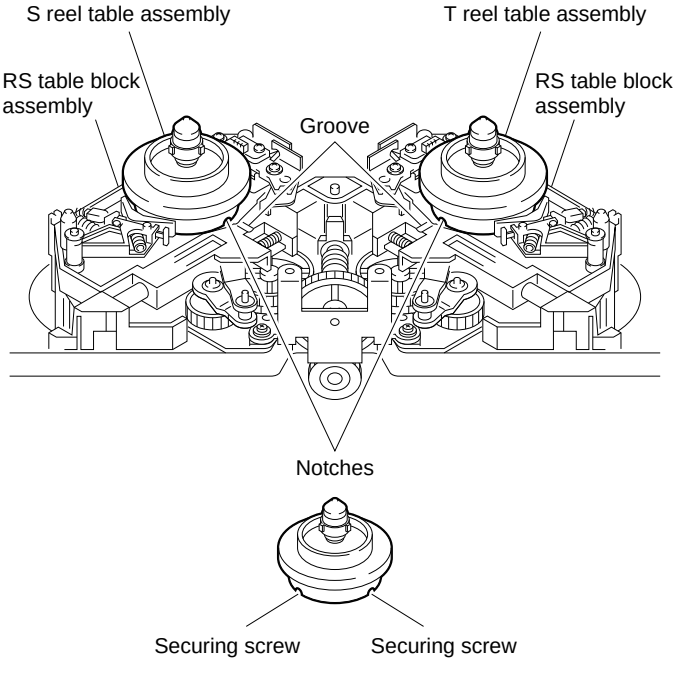
Remove the Reel Table

10. Tighten the Screws of the Reel Table Assembly

(1) Align the notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert an L-shaped wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly and tighten the two screws.

11. Recheck the Reel Table Height

Refer to steps 2 through 6.



Tighten the Screws of the Reel Table Assembly

3-13-2. Reel Brake Clearance Check

Note

- Be sure to check clearance of the reel brake when the reel table assembly is removed or when it is replaced.

Check

1. Check the Take-up Reel Brake Clearance

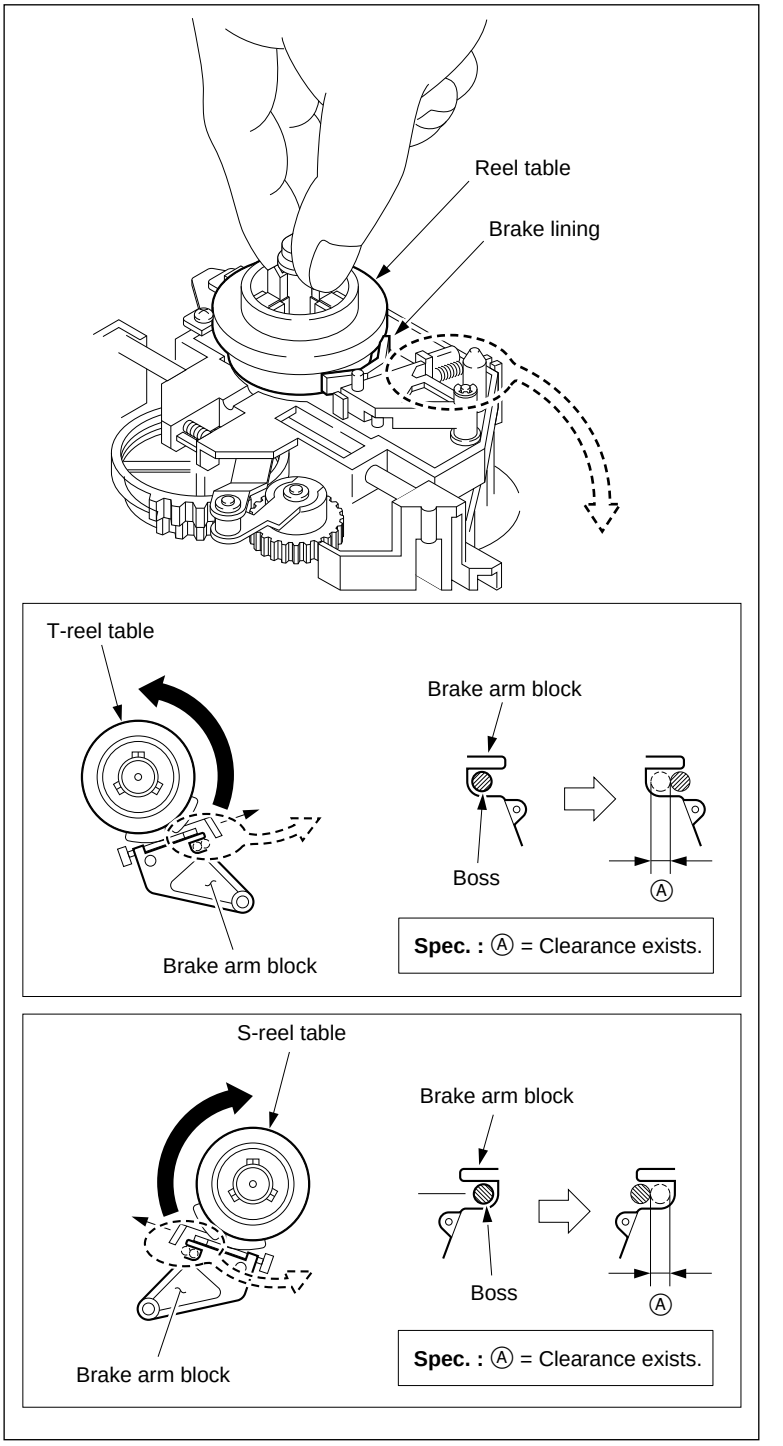
Rotate the take-up reel table counterclockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 3-14.

2. Check the Supply Reel Brake Clearance

Rotate the supply reel table clockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 3-14.



Check the Reel Brake Clearance

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3-13-3. Reel Brake Release Amount Adjustment

Notes

- Be sure to check the release amount of the reel brake when the reel table assembly is removed or when it is replaced.
- Be sure to check the following when performing adjustment with the specification not satisfied.
  (1) Cassette pillar height check (Refer to Section 3-15-3.)
  (2) Reel table height check (Refer to Section 3-13-1)

Basic knowledge

The brake lining is pressed against the reel table when the power is off.
When the power is turned on, the brake lining is released and away from the reel table.
In the PLAY, STOP, REW, F. FWD, SEARCH and REV modes, the brake lining remains released.
Press the EJECT button to put the unit into the EJECT mode. The brake lining is pressed against the reel table a few seconds after the EJECT mode is completed.

Tool

- Wire clearance check gauge set: J-6152-450-A

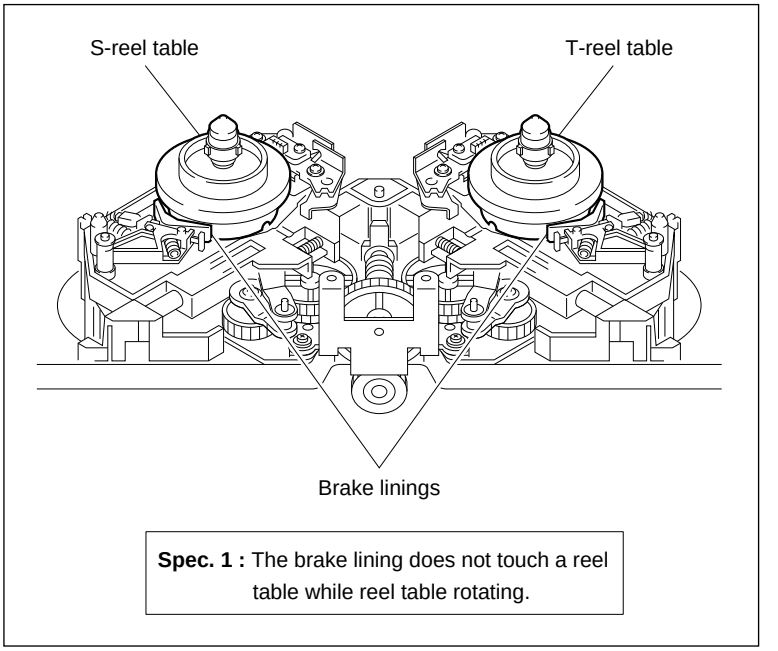
Check

1. Turn the Power On

2. Check the Brake Release Amount

Check on the supply and take-up sides that the brake lining does not touch the reel table while a reel table is rotating. (Specification 1)

If specification 1 is not satisfied, perform steps 3 and later.



Check the Reel Brake Release Amount

Adjustment

3. Turn the Power Off

4. Remove the RS Table Block Assembly
Refer to steps 1 through 3 in Section 3-15-1.
(It is not necessary to remove a reel table.)

5. Loosen the Screws Fixing the Brake Solenoid
Loosen the two screws fixing the brake solenoid.

6. Adjust the Brake Solenoid Position
Press down the iron core of the brake solenoid to the energized position.
At that time, adjust the brake solenoid position so that the clearance between the brake lining and reel table satisfies specification 2.

Note

Press down only the iron core by a sharp-pointed stick. Do no touch other portions.

Know-how:
- Shift the brake solenoid upward.
  →Clearance A is narrowed.
- Shift the brake solenoid downward.
  →Clearance A is widened.

7. Tighten the Screws Fixing the Brake Solenoid
Tighten the two screws loosened in step 5.

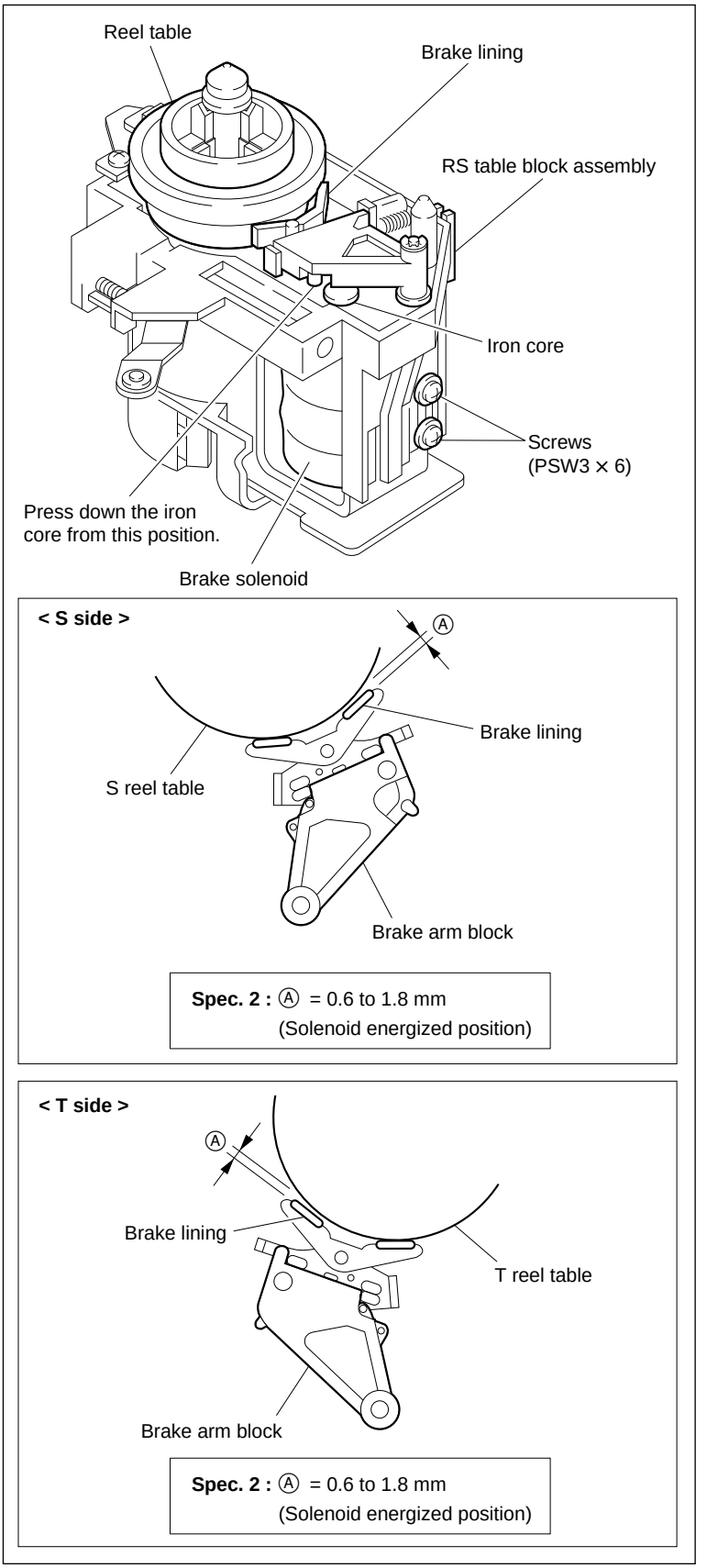
Tightening torque : 98×10^{-2} N•m
(10.0 kgf • cm)

8. Recheck the Brake Release Amount
Refer to step 6.

9. Install the RS Table Block Assembly
Refer to steps 9 through 13 in Section 3-15-1.
(It is not necessary to smear grease again to the slide shaft or to apply oil again to the crank arm (A).)

10. Check the Cassette Pillar Height
Refer to Section 3-15-3.

11. Check the Reel Table Height
Refer to Section 3-13-1.



Check the Reel Brake Release Amount

3-13-4. Reel Table Rotation Sensor Position Adjustment

Note

- Be sure to check the position of the reel table rotation sensor when a reel motor assembly or reel table is replaced.

Tools

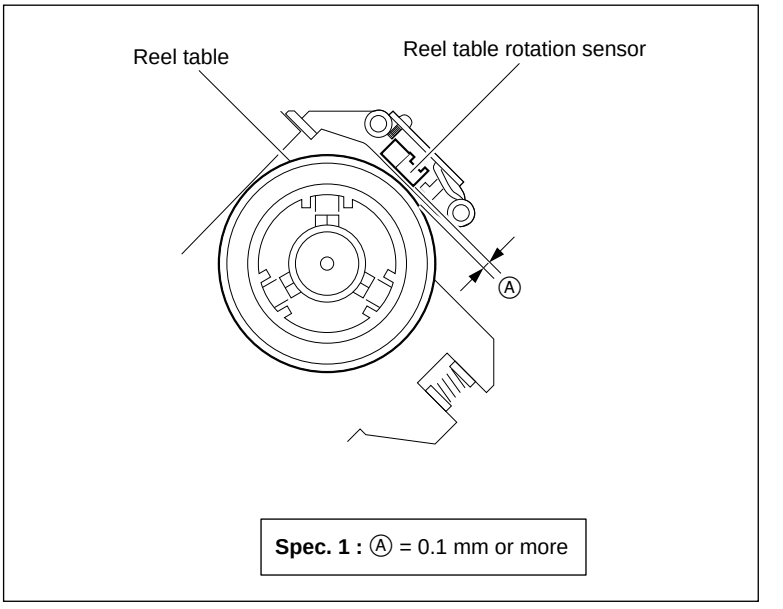
- Thickness gauge : 9-911-053-00
- Torque screwdriver (6 k•cm) (JB-5251) : J-6252-510-A
- Betacam cassette tape

Check

1. Check the Reel Table Rotation Sensor Clearance

Check that the clearance between the reel table and the reel table rotation sensor satisfies the specification 1.

If the specification 1 is not satisfied, perform steps 4 and later.



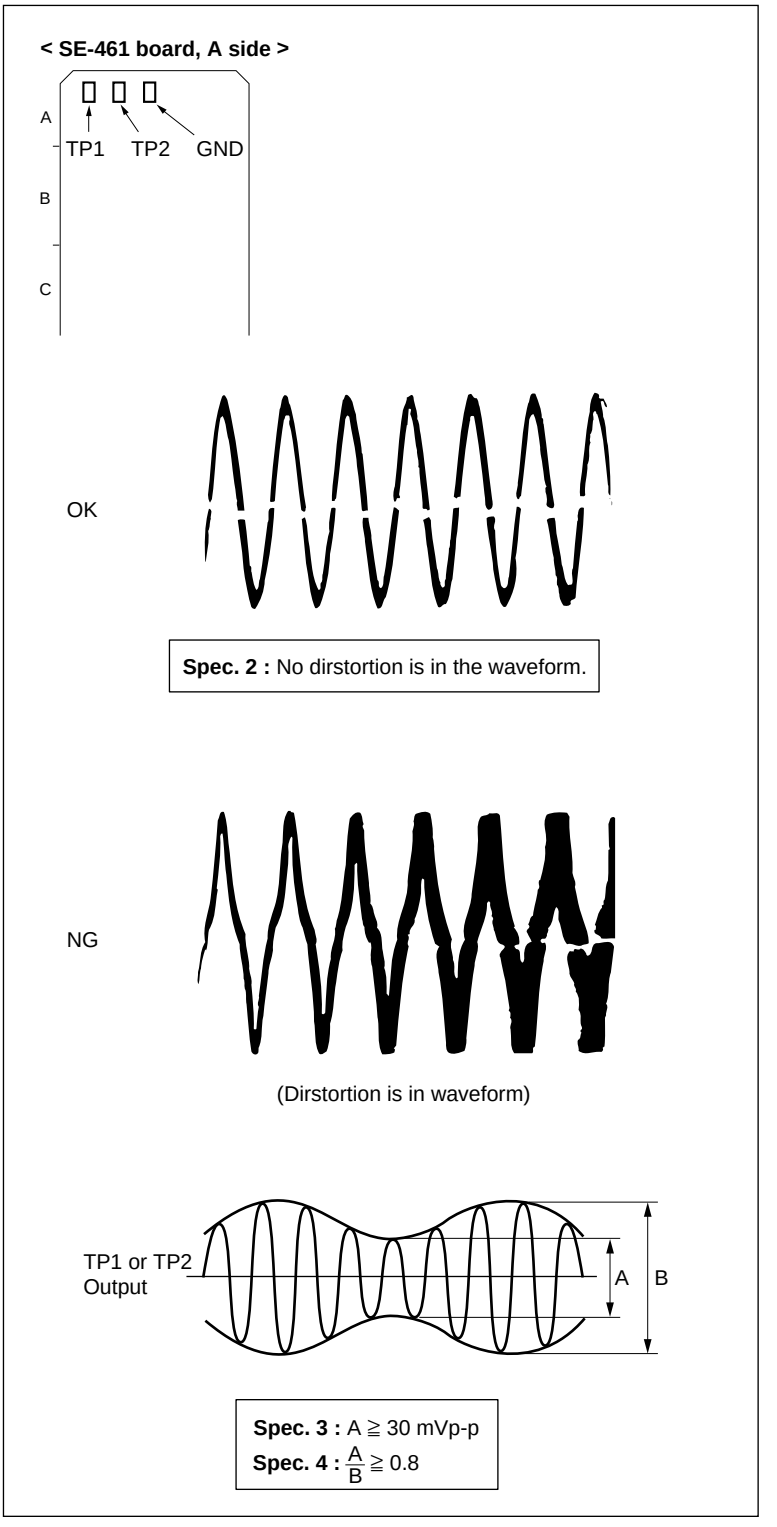
Check the Reel Table Rotation Sensor Clearance

2. Connect the Oscilloscope

CH-1: TP1/SE-461 board (S-FG signal)
CH-2: TP2/SE-461 board (T-FG signal)

3. Check the Reel FG Output Level

(1) Turn the power on.
(2) Put the EJECT mode by putting the EJECT button.
(3) Insert the cassette tape.
(4) Put the unit into the PLAY mode, then check the outputs of CH-1 and CH-2 satisfy the specification 2.
(5) Eject the cassette tape by putting the EJECT button.
(6) Put the unit into the STOP mode in a state of without the cassette tape in the unit by putting the STOP button.
(7) In the Step (6), check that the outputs of CH-1 and CH-2 satify specifications 3 and 4.



Check the Reel FG Output Level

Adjustment

4. Loosen the Screws

Loosen the two screws by 1/4 to 1/2 turn.

5. Adjust the Reel Table Rotation Sensor Position

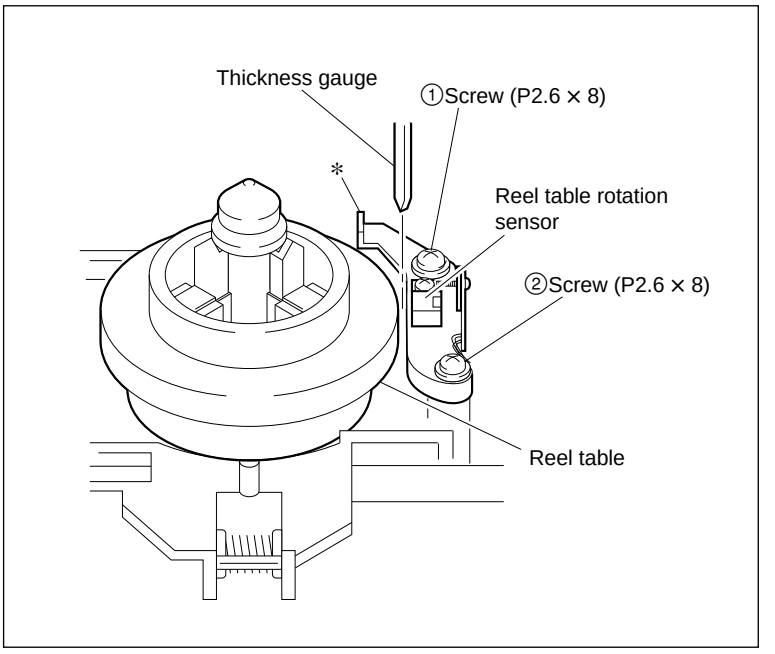
(1) Put the unit into the STOP mode in a state of without cassette tape by putting the STOP button.

(2) Adjust the position of the reel table rotation sensor so that the distortion is not in the waveform, and maximize.

- Adjustment method
  Grasp the portion "✻" with the finger, and adjust the sensor to move in the direction of the left and right.

(3) Tighten the two screws loosen in step 4 in oder of ① and ② while keeping the state of the step (2).

Tightening torque: 49×10^{-2} N•m
(5 kgf • cm)



Adjust the Reel Table Rotation Sensor Position

6. Recheck the Reel Table Rotation Sensor Position

(1) Insert the thickness gauge (t=0.1 mm) between the reel table rotation sensor and the reel table.

CAUTION

Be careful not to damage the reel flange and the reel table rotation sensor.

(2) Rotate the reel table, and check that it rotates smoothly.

(3) Recheck that the specifications 1 through 4 are satisfied referring to steps 1 through 3.

3-14. Brake Lining Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Brake Assembly
3. Remove the Brake Lining
4. Install the Brake Lining
5. Install the Brake Assembly
6. Install the Reel Table Assembly

Adjustment after Replacement

7. Confirm the Reel Table Height (Refer to Section 3-13-1.)
8. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
9. Confirm the Reel Brake Release (Refer to Section 3-13-3.)

Notes

- The brake lining replacement is the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake lining is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

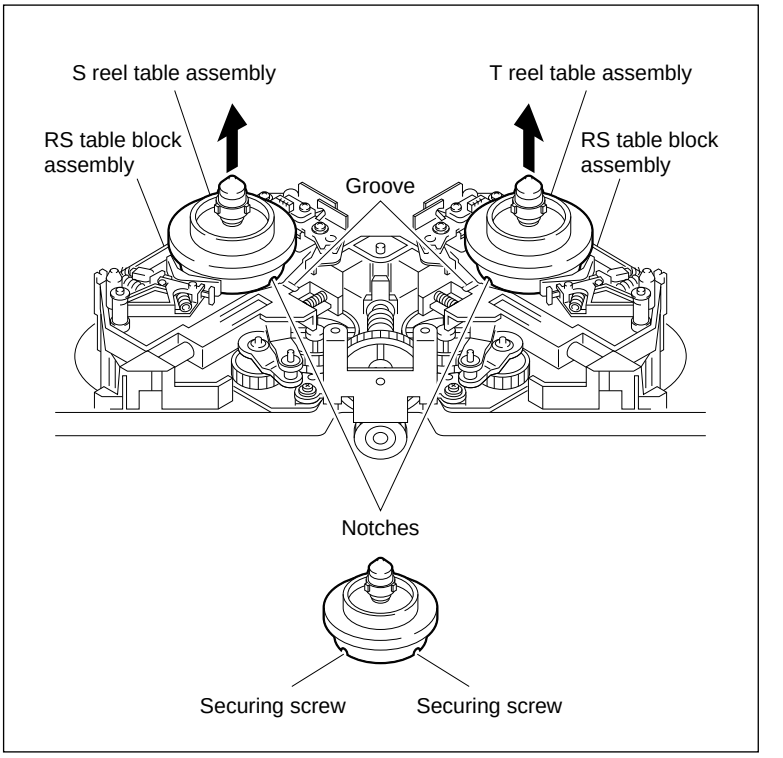
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the reel shift plate assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

2. Remove the Brake Assembly

(1) Remove the spring put on the RS table block assembly.
(2) Remove the E ring, then remove the brake assembly.

3. Remove the Brake Lining

Remove the spring put on the brake arm block, then remove the brake lining.

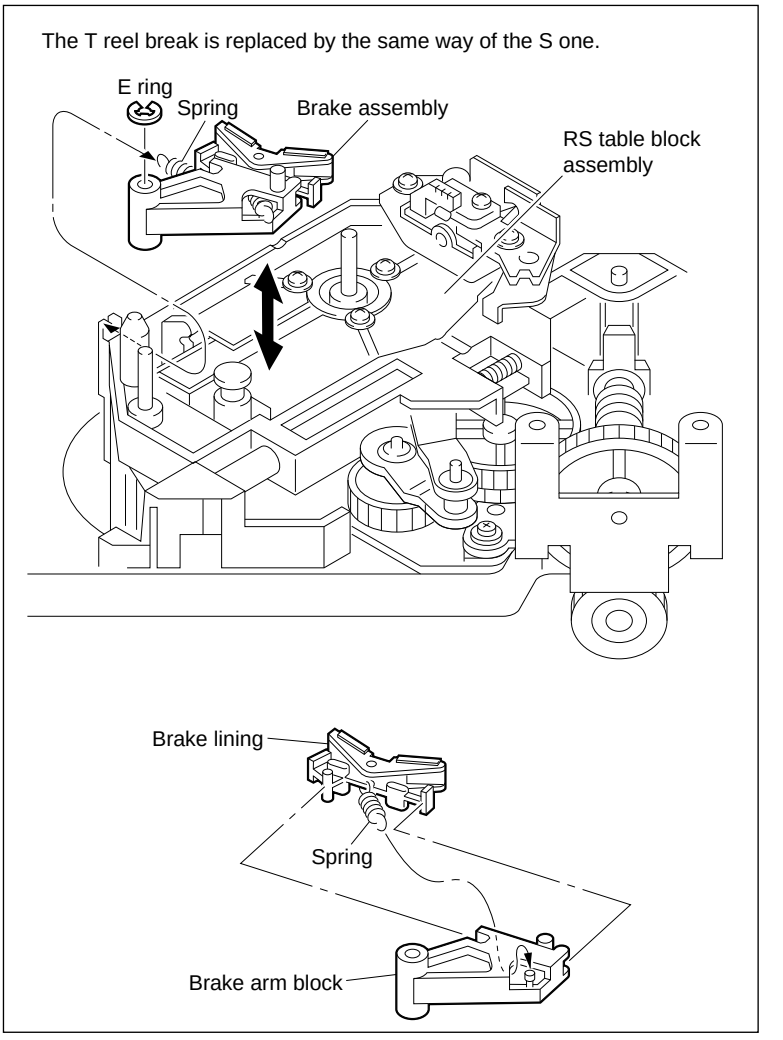
Installation

4. Install the Brake Lining

(1) Combine a new brake lining and brake arm block as shown in the figure.
(2) Hook the spring on the brake arm block.

5. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the RS table block assembly.
(2) Hook the spring on the RS table block assembly.
(3) Install the brake assembly using a new E ring.



Remove/Install the Brake Lining

6. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two screws of the reel table assembly after reel table height adjustment.

Adjustment after Replacement

7. Confirm the Reel Table Height

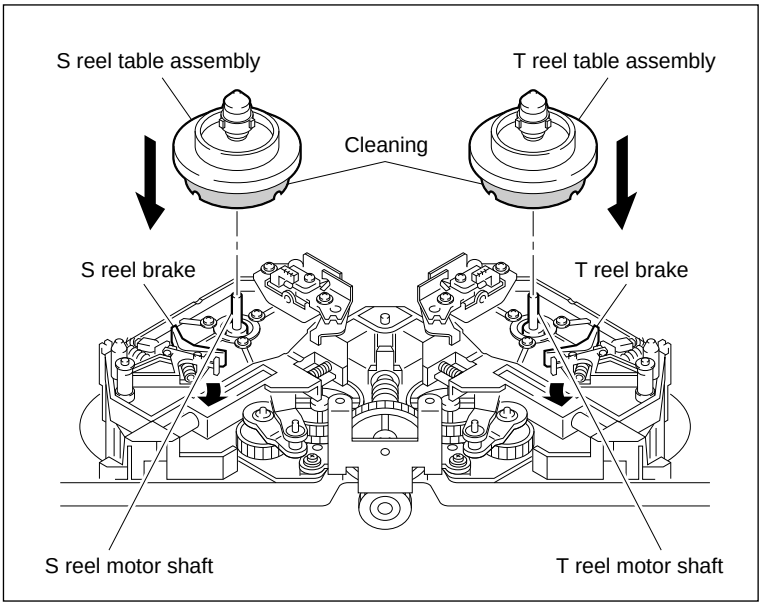
Refer to Section 3-13-1.

8. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

9. Confirm the Reel Brake Release

Refer to Section 3-13-3.



Install the Reel Table Assembly

3-15. Reel Motor Assembly Replacement

Replace the reel motor assembly every 4,000 hours of tape running.

3-15-1. Replacement Procedure of the Reel Motor Assembly

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Holder
3. Remove the RS Table Block Assembly
4. Disconnect the Connectors
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
5. Remove the Reel Motor Assembly
6. Cleaning
7. Install the Reel Motor Assembly
8. Connect the Connectors
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
9. Connect the Flat Cable
   (S side: CN923/RM Board, T side: CN923/RM Board)
10. Install the Slide Shaft
11. Install the RS Table Block Assembly
12. Smear Grease to the Slide Shaft
13. Install the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness (Refer to Section 3-15-2.)
15. Install the Reel Table Assembly
16. Confirm the Cassette Pillar Height (Refer to Section 3-15-3.)
17. Confirm the Reel Table Height (Refer to Section 3-13-1.)
18. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
19. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
20. Perform the Rell Table Rotation Sensor Position Adjustment
    (Refer to Section 3-13-4.)
21. Perform the Reel Motor Operation Check
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C010: S REEL MOTOR/C011: T REEL MOTOR)
22. Perform the Reel FG Duty Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A001: S REEL FG DUTY/A002: T REEL FG DUTY)
23. Perform the Reel Motor Offset/Friction Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A004: S REEL OFFSET/FRIC/A005: T REEL OFFSET/FRIC)
24. Perform the Reel Torque Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A006: S REEL TORQUE/A007: T REEL TORQUE)
25. Perform the Adjustmented Data Save
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A012: NV-RAM CONTROL)

Note

The parts consisting reel motor is different between S side and T side. However, how to replace the reel motor assembly is the same for both sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L-shaped wrench (1.5 mm) : 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver+s bit (+ 3 mm, l = 90 mm) : J-6323-430-A
- Grease (SGL-601) : 7-651-000-10
- Oil : 7-661-018-18
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

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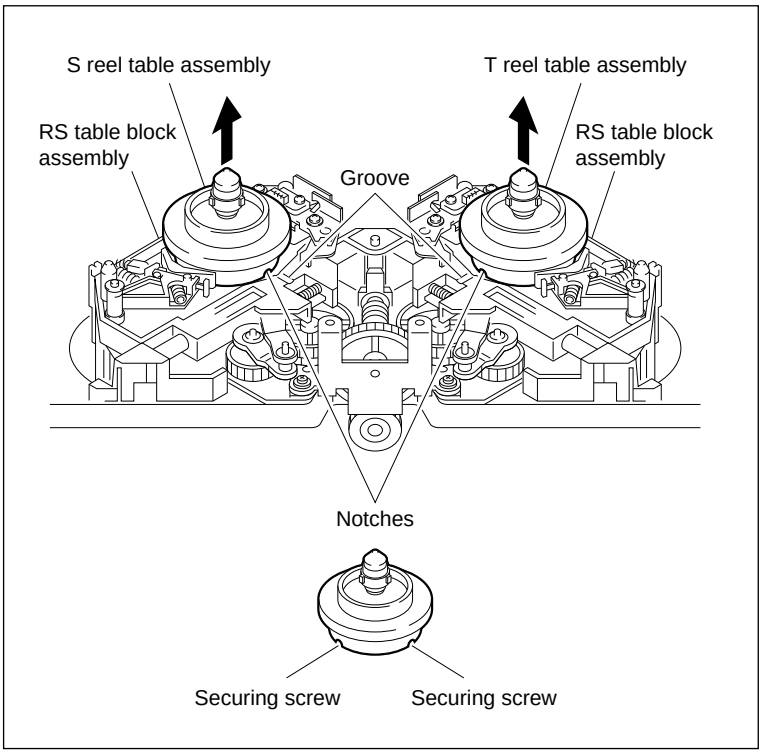
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove of the RS table block assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the screw.
(4) Align another notch of the reel table assembly with the groove of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

CAUTION

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft position.
This poly-slider washer is used for reel table height adjustment.



Remove the Reel Table Assembly

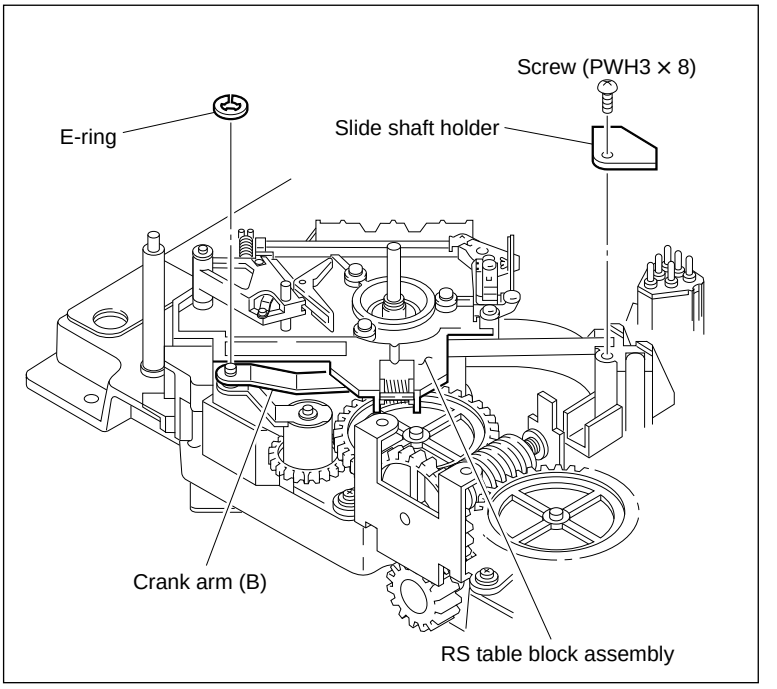
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove an E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft holder.



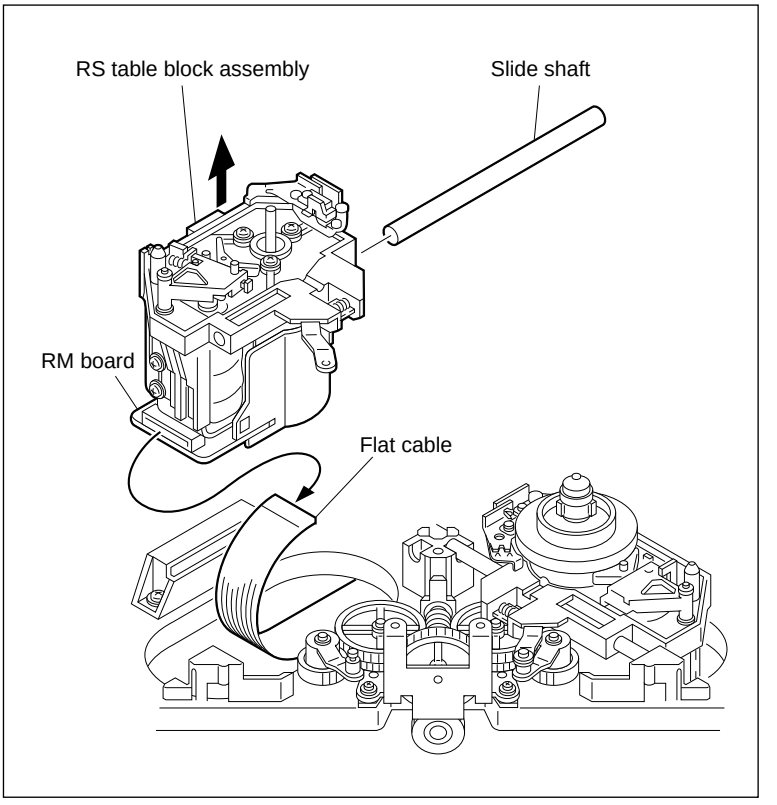
Remove the Crank Arm and Slide Shaft Holder

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft and remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

CAUTION

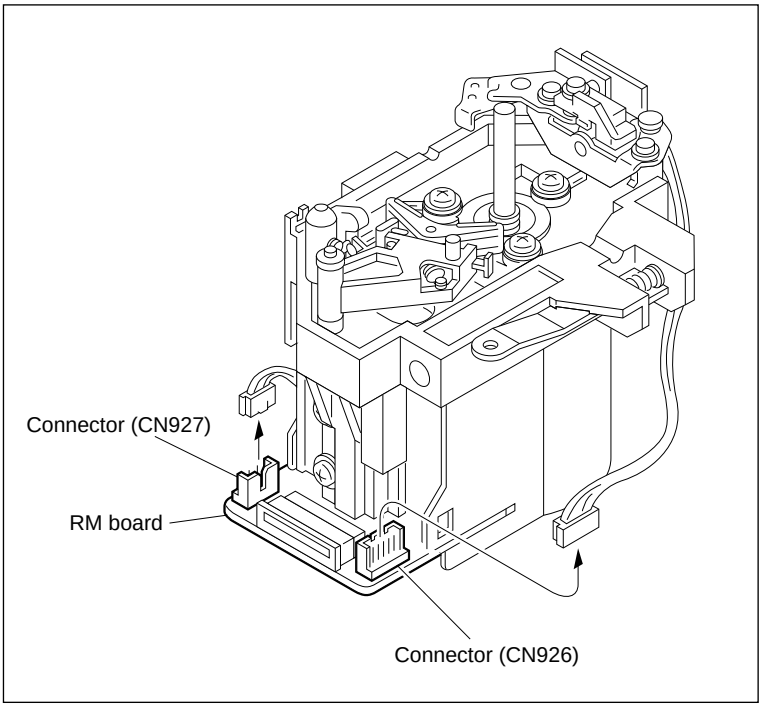
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



Remove the RS Table Block Assembly

4. Disconnect the Connectors

Disconnect the harness from the two connectors CN926 and CN927 on the RM board.



Disconnect the Connectors

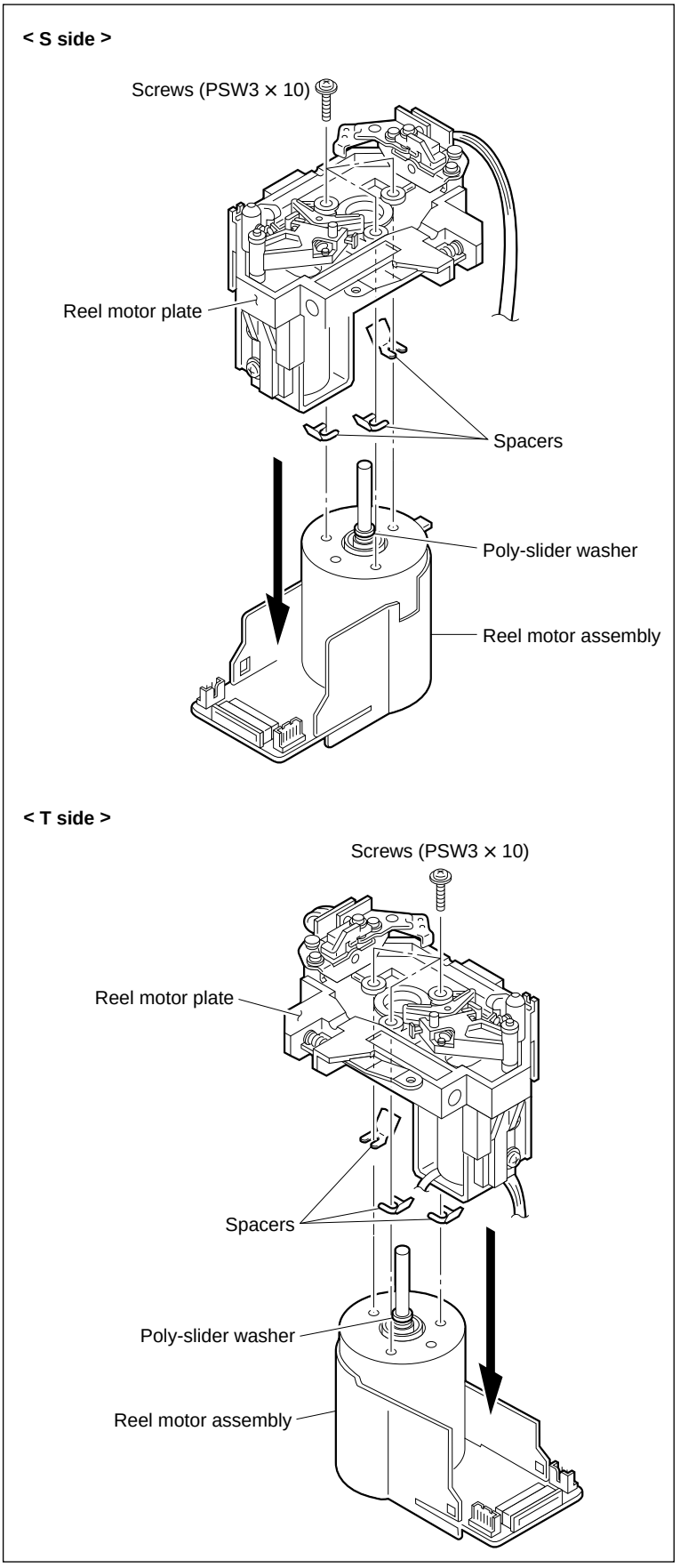
5. Remove the Reel Motor Assembly

(1) Remove the three screws and remove the reel motor assembly.

CAUTION

The spacer(s) is inserted between the reel motor and the reel motor plate. Be careful not to lose spacer(s) since it comes off with the reel motor assembly.

(2) Remove the poly-slider washer from the reel motor shaft.
Be careful not to loose the removed poly-slider washer.



Remove the Reel Motor Assembly

Installation

6. Cleaning

Clean the reel motor assembly mounting surface and reel motor plate mounting surface.

7. Install the Reel Motor Assembly

(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

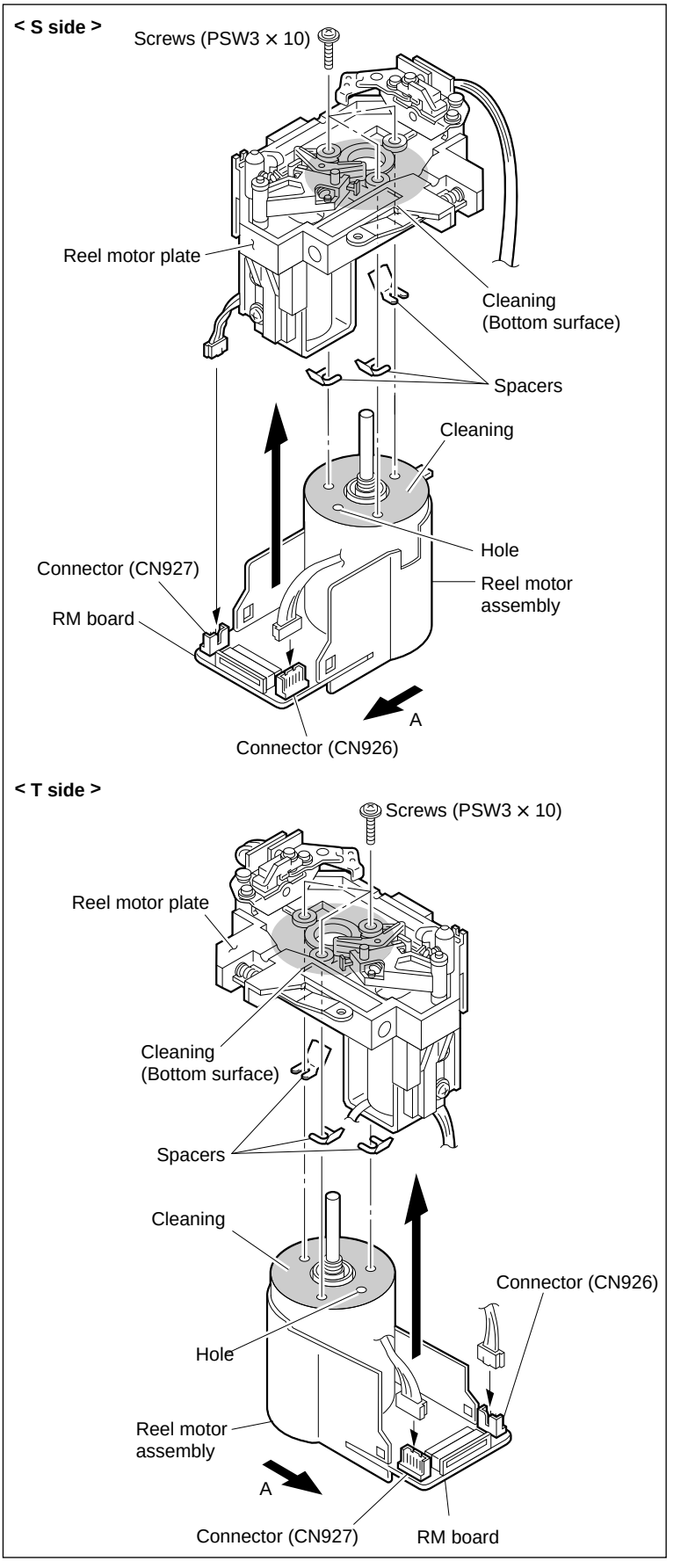
(2) Tighten the three screws gradually while moving the reel motor assembly in the direction indicated by the arrow A.

Tightening torque: 68.6×10^{-2} N•m
(7 kgf • cm)

(3) Pass the poly-slider washer removed in (2) of step 5 through the reel motor shaft.

8. Connect the Connectors

Connect the harness to the two connectors CN926 and CN927 on the RM board.



Install the Reel Motor Assembly

Install the Slide Shaft

9. Connect the Flat Cable

(1) Clean the insertion of the flat cable with a dry cleaning cloth.
(2) Connect the flat cable disconnected in step 3 into the connector on the RM board, then lock.

CAUTION

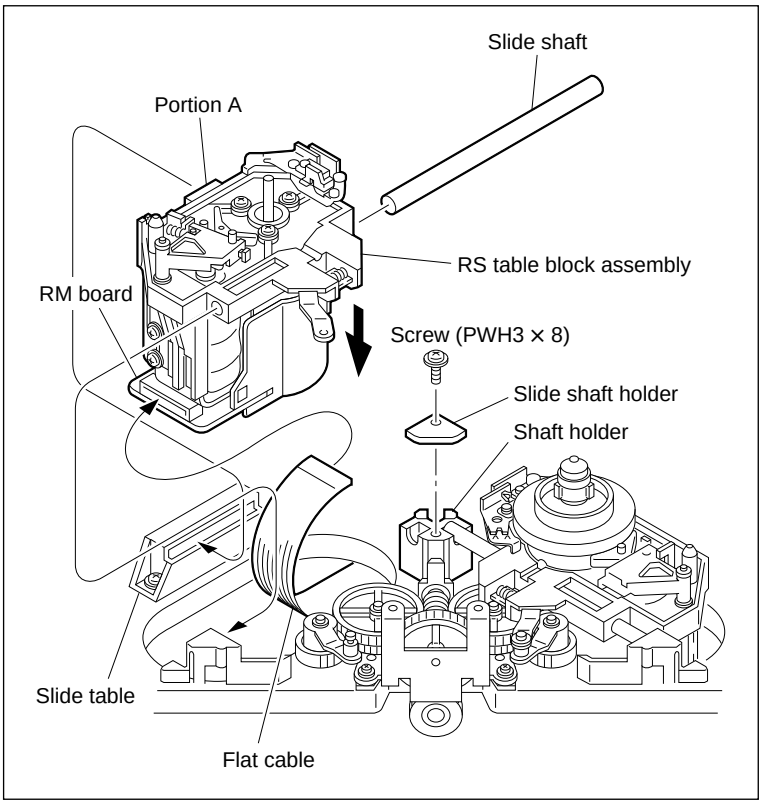
- Connect the flat cable with its conductor side (printing surface) upside.
- Be careful not to twist the flat cable when connecting it.

10. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

11. Install the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.
(2) Install the slide shaft holder.



Install the Slide Shaft

12. Smear Grease to the Slide Shaft

(1) Smear grease very lightly to the slide shaft.

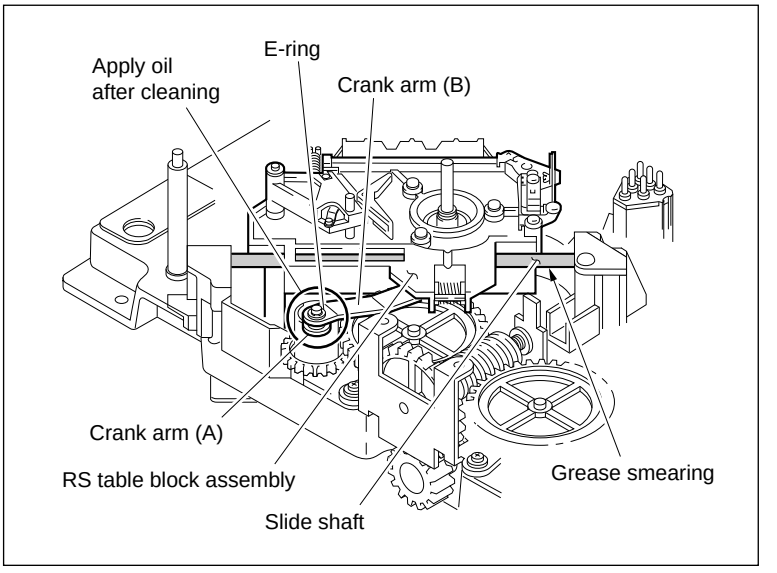
Note

Be careful that the grease does not adhere to ther parts.

(2) Confirm that the RS table block assembly moves smoothly when moving it by hand towards S cassette and L cassette positions.

13. Install the Crank Arm

(1) Clean the shaft of the crank arm (A), then pour a drop of oil on it.
(2) Confirm that the RS table block assembly is in the intermediate position of S and L cassettes.
(3) Install the crank arm (B) to the shaft of the crank arm (A) with an E ring.



Install the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness

Refer to Section 3-15-2.

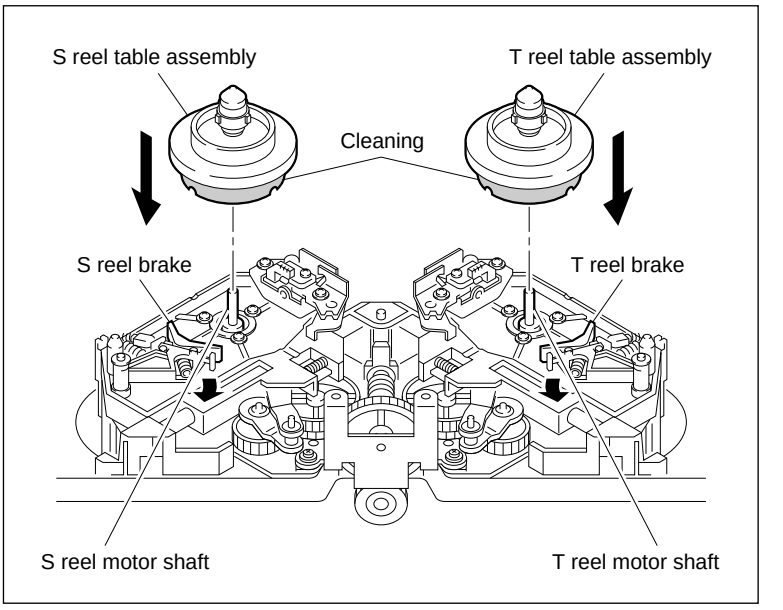
15. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) Pass the reel table assembly through the reel motor shaft while moving the reel brake in the direction indicated by the arrow.

CAUTION

Tighten two securing screws after the reel table height adjustment is complated.



Install the Reel Table Assembly

16. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

17. Confirm the Reel Table Height

Refer to Section 3-13-1.

18. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

19. Confirm the Reel Brake Release Amount

Refer to Section 3-13-3.

20. Reform the Reel Table Rotation Sensor Position Adjustment

Refer to Section 3-13-4.

21. Perform the Reel Motor Operation Check

Refer to Section 4-2 of the maintenance manual part 1.
(C010: S REEL MOTOR/
C011: T REEL MOTOR)

22. Perform the Reel FG Duty Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A001: S REEL FG DUTY/
A002: T REEL FG DUTY)

23. Perform the Reel Offset/Friction Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A004: S REEL OFFSET/FRIC/
A005: T REEL OFFSET/FRIC)

24. Perform the Reel Torque Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A006: S REEL TORQUE/A007: T REEL TORQUE)

25. Perform the Adjustmented Data Save

Refer to Section 4-2 of the maintenance manual part 1.
(A012: NV-RAM CONTROL)

3-15-2. Reel Motor Shaft Slantness Adjustment

Notes

- Be sure to check the slantness of the reel motor shaft when the reel motor assembly is removed or when the RS table block assembly is removed.
- Perform the reel motor shaft slantness adjustment correctly.
  If this adjustment is not performed correctly, a reel hub touches the case in a cassette tape, a noise occurs, and the tape does not run correctly. This may damage the tape.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel motor shaft slantness check tool (MW-087) : J-6320-870-A
- Thickness gauge : 9-911-053-00
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver+s bit (+3 mm, l=50 mm) : J-6323-430-A

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the Reel Shift Plate Assembly in the L Cassette Position

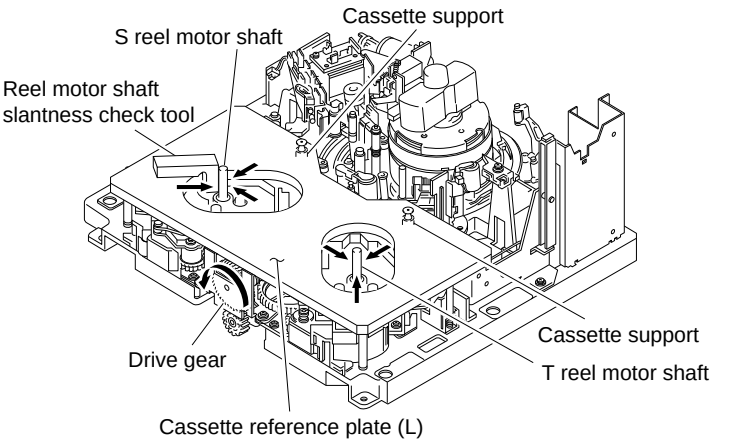
Rotate the drive gear counterclockwise as far as it will go.

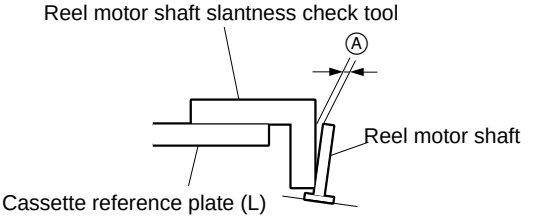
3. Check the Slantness in the L Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool satisfies specification 1.

If the specification is not satisfied, perform steps 6 through 10.

< L cassette position >





Spec.1 : (L cassette position)
A ≦ 0.03 mm

Check the Reel Motor Shaft Slantness (L)

4. Place the Reel Shift Plate Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

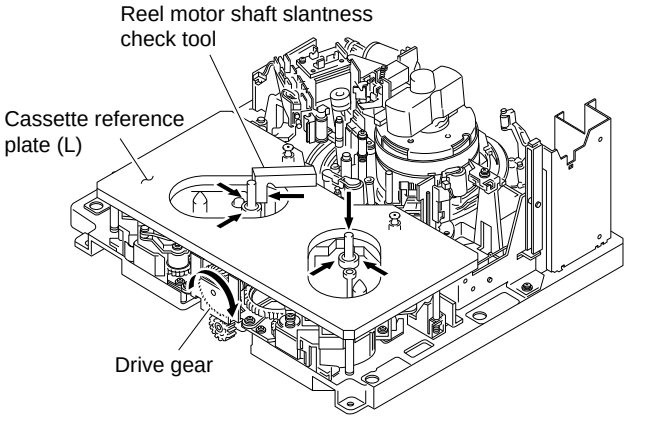
5. Check the Slantness in the S Cassette Position

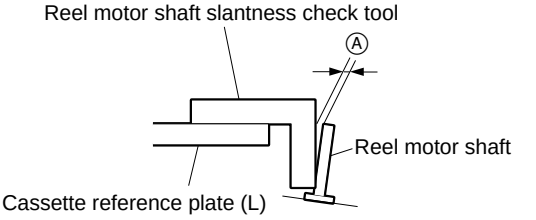
(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.

(2) Check that the clearance between the reel motor shaft and tool satisfies specification 2.

If the specification is not satisfied, perform steps 6 and later.

< S cassette position >





Spec. 2 : (S cassette position)
A ≦ 0.1 mm

Check the Reel Motor Shaft Slantness (S)

Adjustment

6. Loosen Screws

Loosen the three screws fixing the reel motor by one to two turns.

7. Bend Spacer

Bend the adjustment spacer as shown in the figure.

8. Insert Spacer

Insert the adjustment spacer into the square hole on the upper surface of the reel motor plate with tweezers.

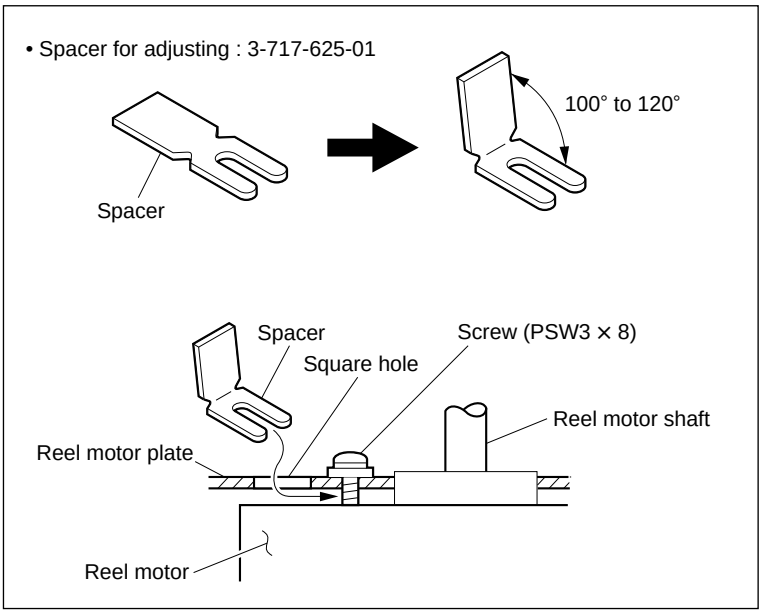
9. Tighten Screws

Gradually tighten the three screws loosened in step 6.

Tightening torque: 68.6×10^{-2} N•m (7 kgf • cm)

10. Recheck the Reel Motor Shaft Slantness

Refer to steps 2 through 5.



Ajustment the Reel Motor Shaft Slantness

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3-15-3. Cassette Pillar Height Adjustment

Note

- Be sure to check the height of the cassette pillars when the reel shift plate assembly is removed.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Small dental mirror (circular) : J-6080-029-A
- L-shaped wrench (1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette pillars.

2. Place the Reel Shift Plate Assembly in the Intermediate Position of S and L Cassettes

(1) Rotate the drive gear and place the reel shift plate assembly in the intermediate position of S and L cassettes.

Note

The reel shift plate assembly should be moved to the position where the cassette pillars do not appear from the hole of the cassette reference plate (L).

(2) Check that the S and T cassette pillars are positioned under the cassette reference plate (L).

3. Check the Cassette Pillar Height

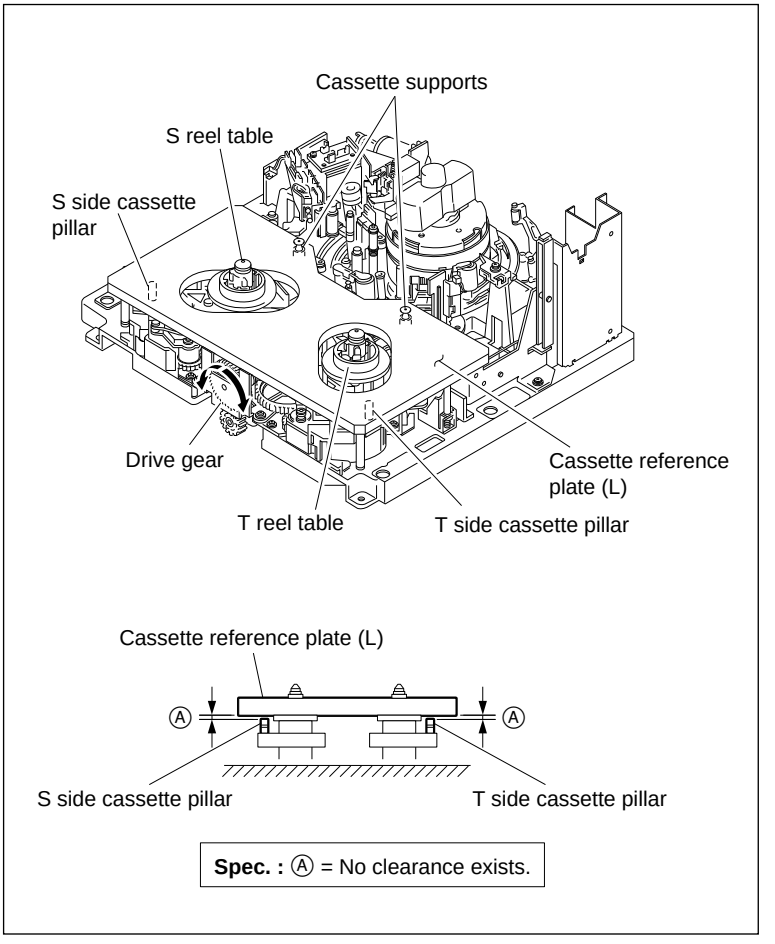
(1) Turn the casstte reference plate (L) over and place it on the cassette pillars.

Note

The reference plate should be turned over because it has a concave portion at the back of the cassette reference plate (L) and cannot be adjusted correctly.

(2) Check with a small dental mirror that there are no clearances between the S and T cassette pillars and the reference plate (L).

If the specification is not satisfied, perform steps 4 through 6.



Check the Cassette Pillar Height

Adjustment

4. Loosen the Securing Screw

Loosen the securing screw of the S or T cassette pillar by one to two turns.

5. Adjust the Cassette Pillar Height

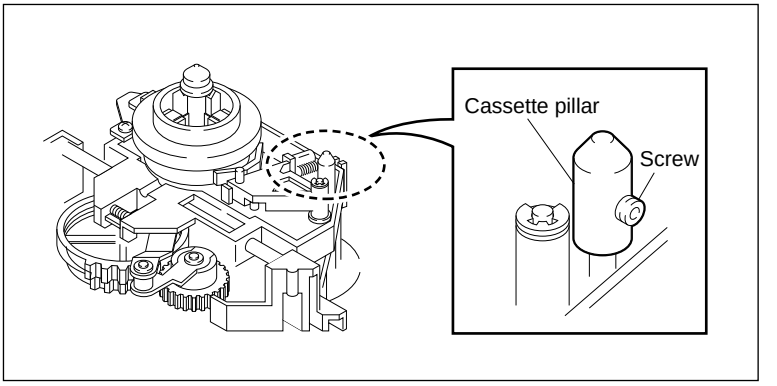
Lift the cassette pillar and press it slightly against the lower surface of the cassette reference plate (L).
Tighten the securing screw under this condition.

6. Recheck the Cassette Pillar Height

Check that the height of the S and T cassette pillars satisfy the specification.

CAUTION

Shift the tightening position of the fixing screw when performing readjustment with the specification not satisfied. (Do not tighten the screw in the same position as previous.)



Adjust the Cassette Pillar Height

3-16. Brake Solenoid Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Support
3. Remove the RS Table Block Assembly
4. Disconnect the Harness (CN926 and CN927/RM Board)
5. Remove the Reel Motor Assembly
6. Remove the Brake Assembly
7. Remove the Brake Solenoid
8. Install the Brake Solenoid
9. Install the Brake Assembly
10. Cleaning (Reel Motor Assembly)
11. Install the Reel Motor Assembly
12. Connect the Harness (CN926 and CN927/RM Board)
13. Connect the Flat Cable
14. Install the Slide Shaft
15. Install the RS Table Block Assembly
16. Applying Grease to Slide Shaft
17. Install the Crank Arm

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness (Refer to Section 3-15-2.)
19. Install the Reel Table Assembly
20. Confirm the Cassette Pillar Height (Refer to Section 3-15-3.)
21. Confirm the Reel Table Height (Refer to Section 3-13-1.)
22. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
23. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
24. Confirm the Brake Solenoid Operation
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C021: S REEL BRAKE/C022: T REEL BRAKE)

Notes

- The brake solenoid replacement and its adjustment after replacement are the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake solenoid is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (d = 1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg • cm)(JB-5252): J-6252-520-A
- Torque screwdriver bit (+3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

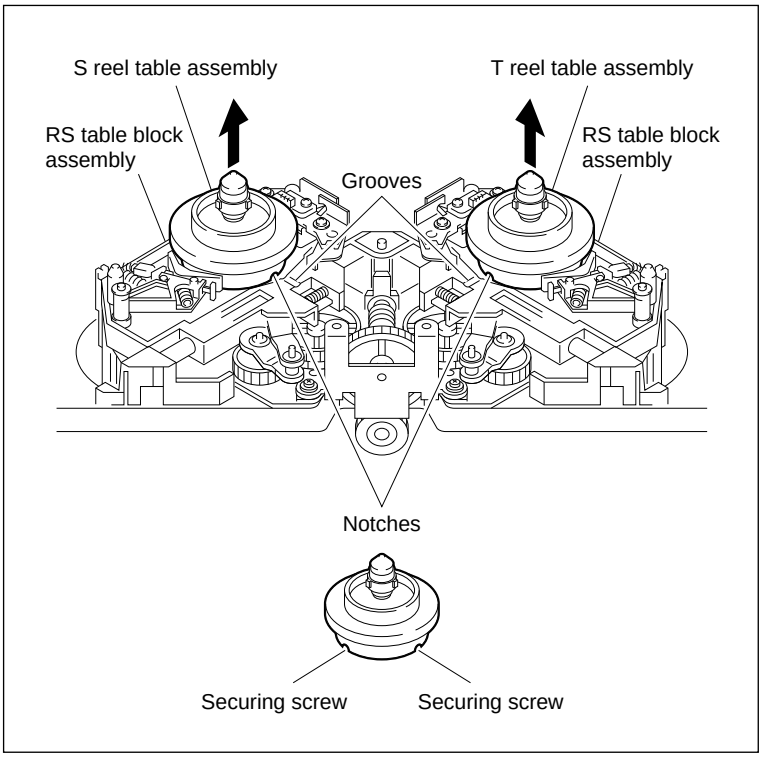
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the screw.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

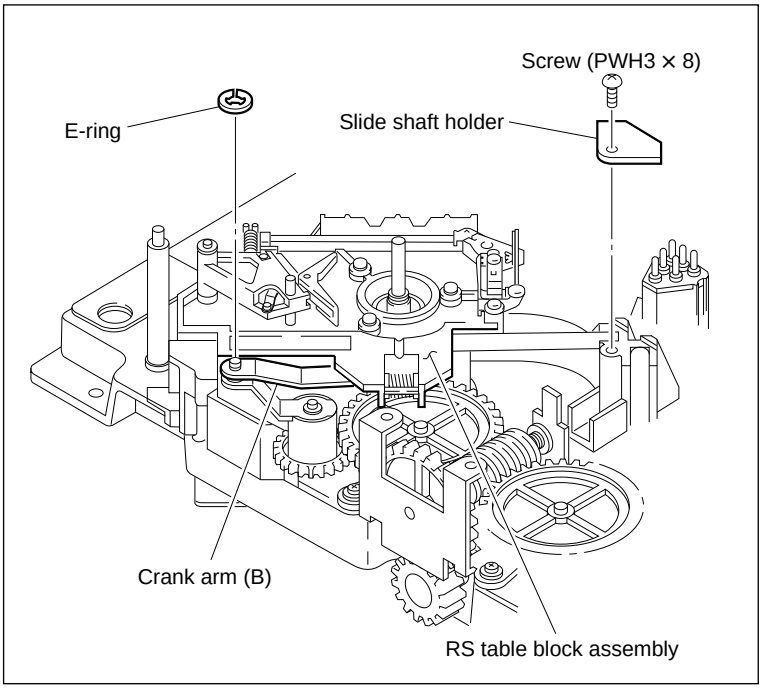
2. Remove the Crank Arm and Slide Shaft Support

(1) Set the RS table block assembly to the intermediate position between S and L cassettes.

Note

The RS table block assembly cannot be removed in the S or L cassette position.

(2) Remove the E ring, then remove the crank arm (B).
(3) Remove the screw, then remove the slide shaft support.



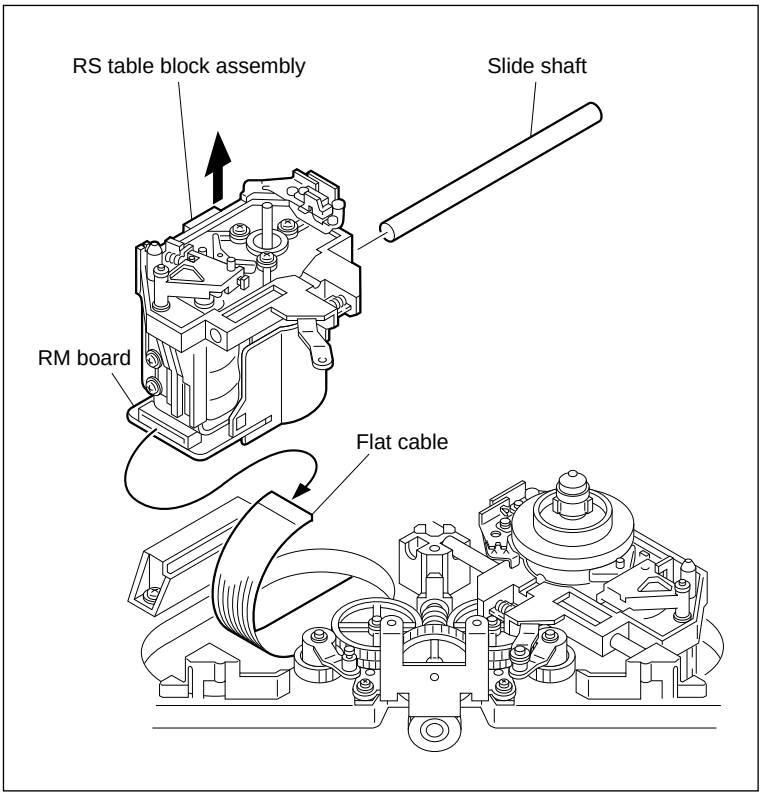
Remove the Crank Arm and Slide Shaft Support

3. Remove the RS Table Block Assembly

(1) Remove the RS table block assembly while pulling out the slide shaft.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease attached on the two holes, from which the slide shaft of the RS table block assembly was pulled out, with cloth.
(4) Wipe the grease attached on the surface of the slide shaft with cloth.

Notes

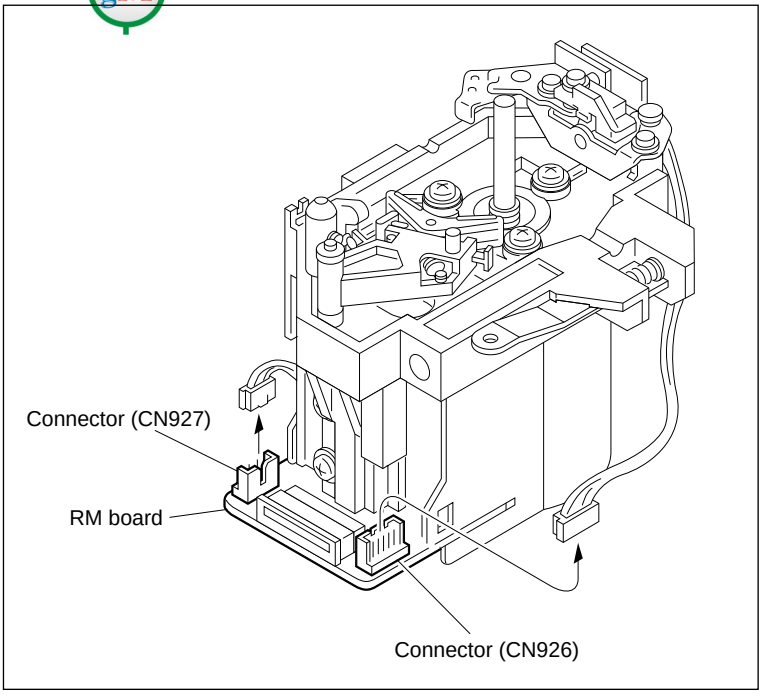
- Be careful the grease on the slide shaft does not adhere to other parts.
- Be careful not to damage the slide shaft.



Remove the RS Table Block Assembly

4. Disconnect the Harness

Disconnect the harness from the connectors CN926 and CN927 on the RM board.



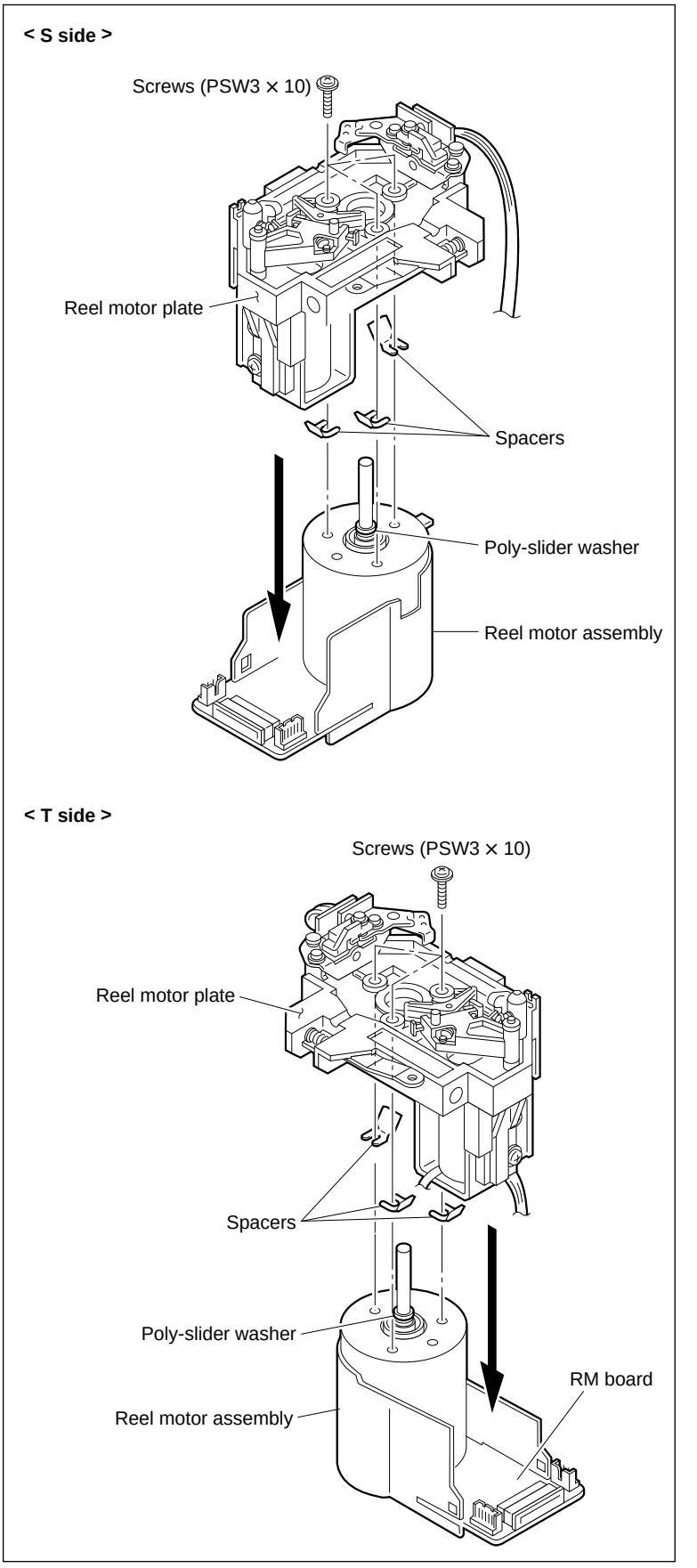
Disconnect the Harness

5. Remove the Reel Motor Assembly

Remove the three screws, then remove the reel motor assembly.

Notes

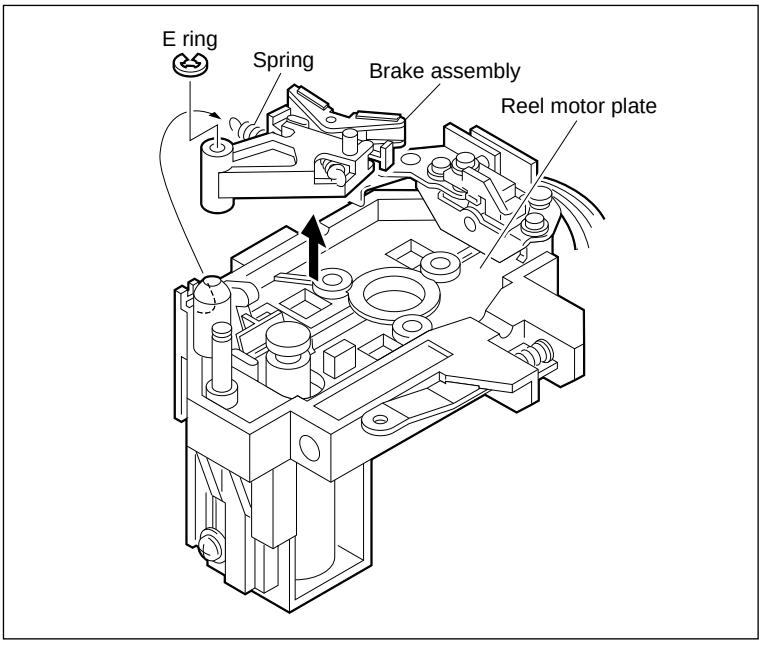
- Spacers are inserted between the reel motor and reel motor plate.
  These spacers are also removed together when the reel motor assembly is removed. Be careful not to lose them.
- Do not remove the polywasher that is passed through the reel motor shaft.



Remove the Reel Motor Assembly

6. Remove the Brake Assembly

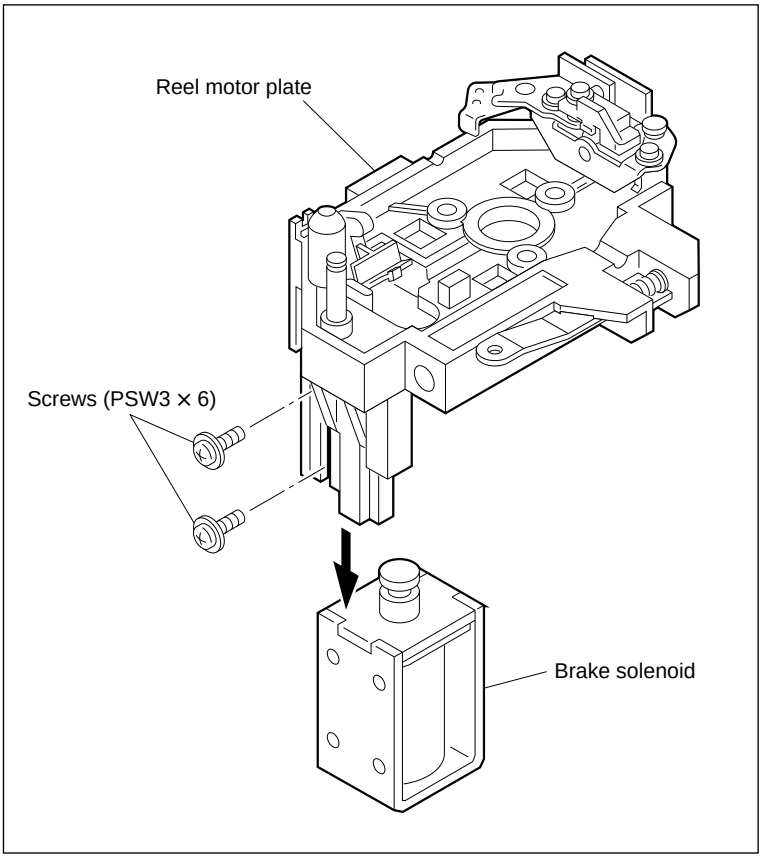
(1) Remove the spring put on the reel motor plate.
(2) Remove the E ring, then remove the brake assembly.



Remove the Brake Assembly

7. Remove the Brake Solenoid

Remove the two screws, then remove the brake solenoid.

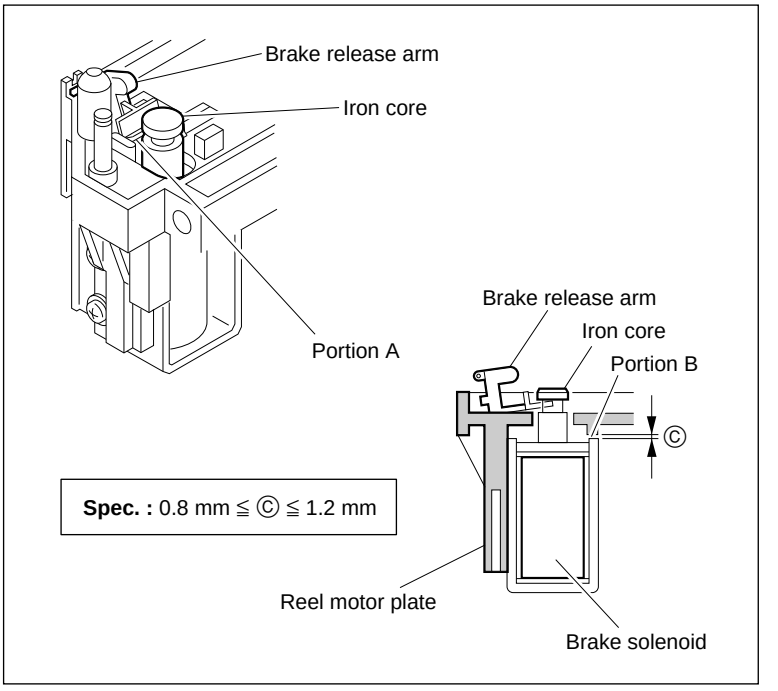


Remove the Brake Solenoid

Installation

8. Install the Brake Solenoid

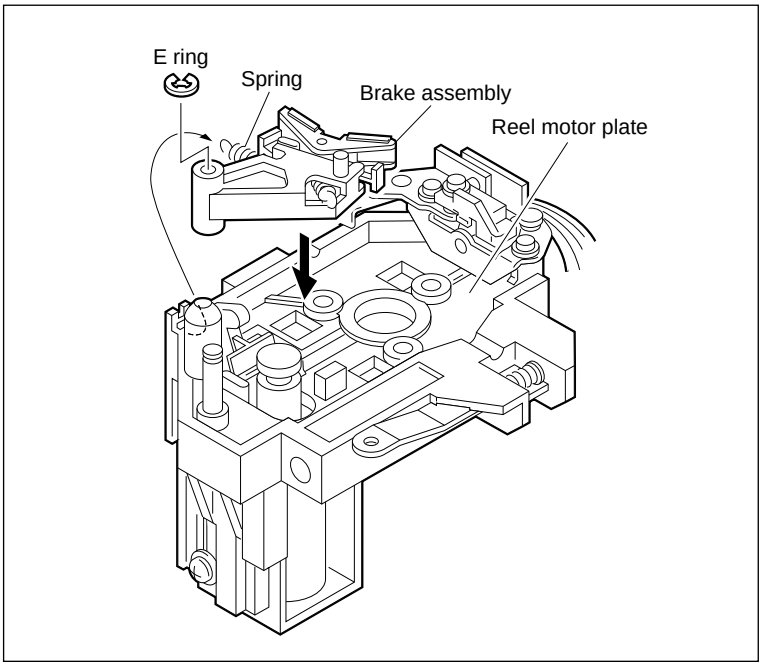
(1) Attach the brake solenoid temporary with two screws while inserting portion A of the brake release arm into the groove of the iron core.
(2) Put a thickness gauge (1.00 mm thick) between the solenoid and reel motor plate (portion B).
(3) Tighten the screws while pushing the solenoid slightly against the reel motor plate.
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the solenoid and reel motor plate satisfies the specification.



Install the Brake Solenoid

9. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the reel motor plate.
(2) Put the spring on the reel motor plate.
(3) Fix the brake assembly using an E ring.
E ring (2.3): 7-624-105-04



Install the Brake Assembly

10. Cleaning

Clean the installation surface of the reel motor assembly and reel motor plate.

11. Install the Reel Motor Assembly

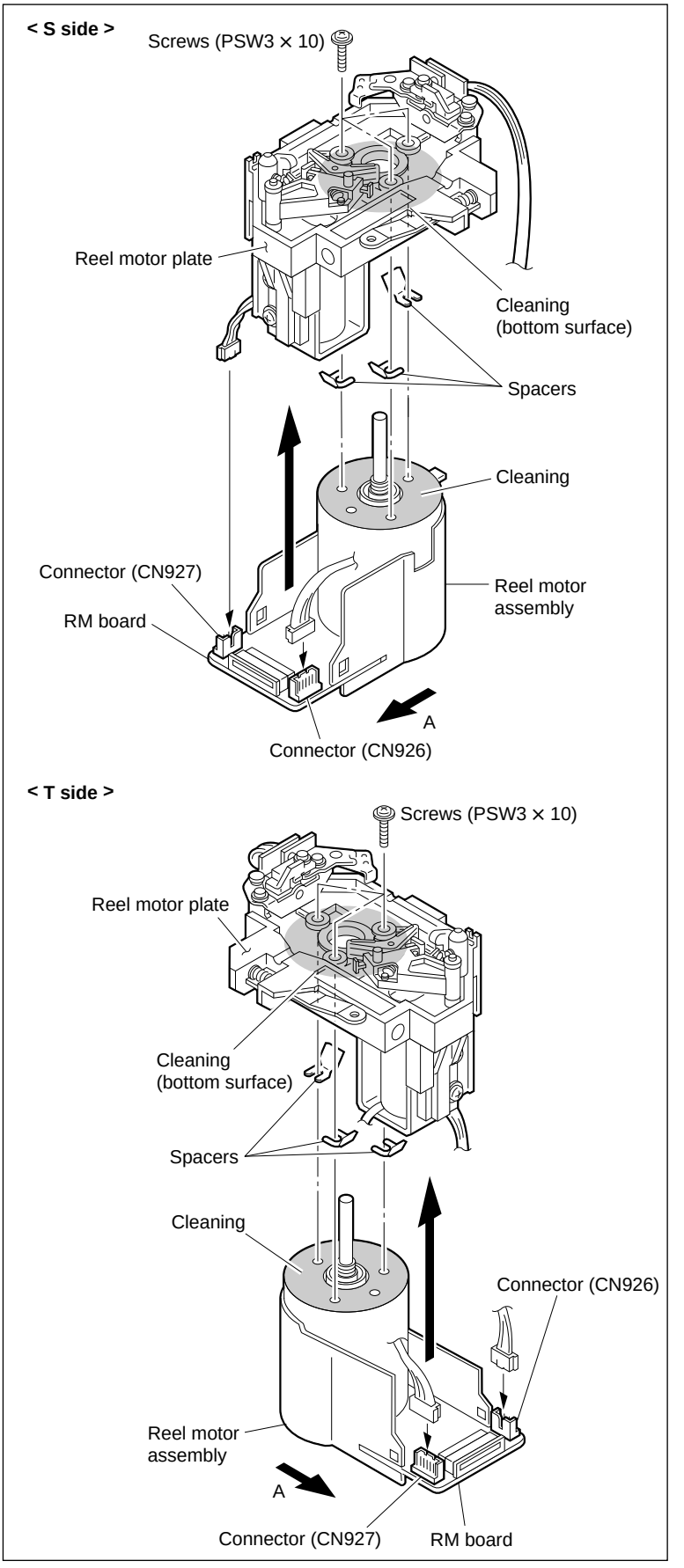
(1) Pass the reel motor assembly through the hole of the reel motor plate in the direction shown in the figure.

(2) Move the reel motor assembly in the direction indicated by arrow A and tighten the three screws gradually.

Tightening torque: 68.6×10^{-2} N • m
(7.0 kgf • cm)

12. Connect the Harness

Connect the connectors to CN926 and CN927 on the RM board.



Install the Reel Motor Assembly

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13. Connect the Flat Cable

(1) Clean the flat cable plug-in port on the RM board.
(2) Connect the flat cable disconnected in step 3 to the connector.

Notes

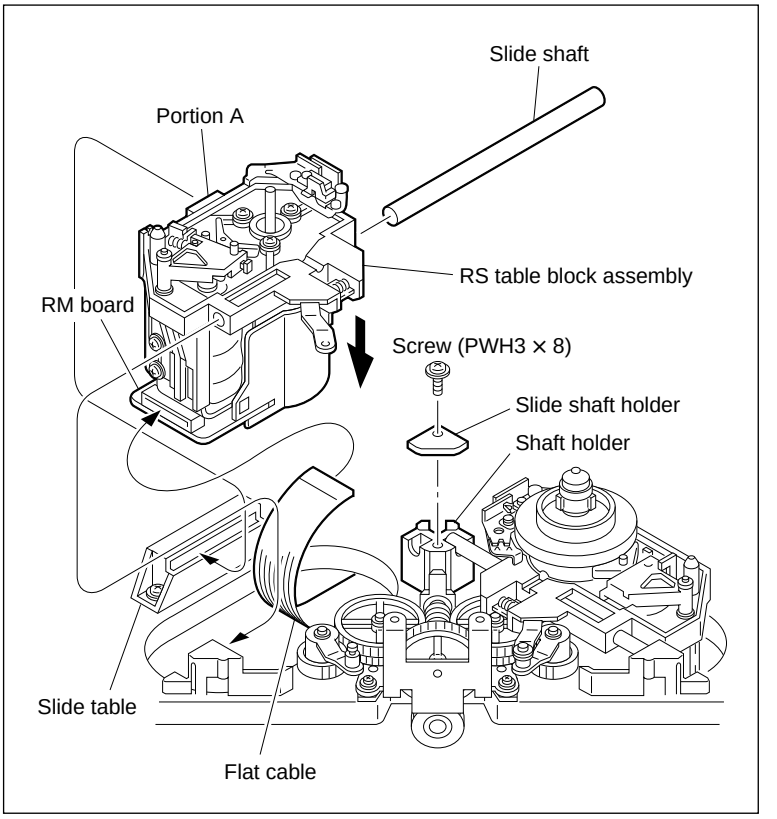
- Connect the flat cable with the conductor plating part (printing side) up.
- Be careful not to bend the flat cable when it is connected.

14. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

15. Install the RS Table Block Assembly

(1) Put the slide shaft in the shaft holder while inserting portion A of the RS table block assembly shown in the figure into the slide table.
(2) Install the slide shaft support.



Install the RS Table Block Assembly

16. Applying Grease to Slide Shaft

(1) Apply grease slightly to the slide shaft and extend it to the whole slide shaft.
(2) Confirm that the RS table block assembly moves smoothly when it is shifted to the S- and L-cassette positions.

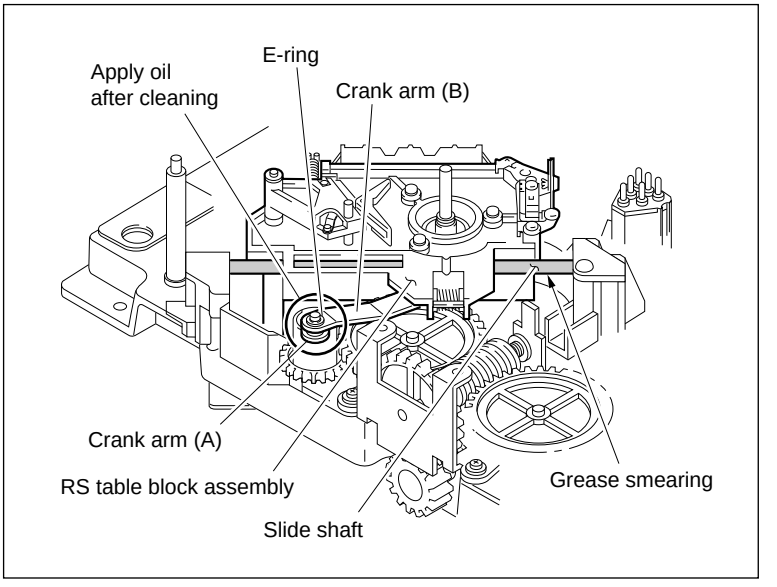
17. Install the Crank Arm

(1) Clean the shaft of the crank arm (A) and apply one drop of oil to it.
(2) Confirm that the RS table block assembly is in the intermediate position between S and L cassettes.

Note

Install the crank arm in the intermediate position between S and L cassettes for the adjustment of gear phase.

(3) Install the crank arm (B) in the shaft of the crank arm (A) using an E ring.



Applying Grease to Slide Shaft/Crank Arm Installation

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness

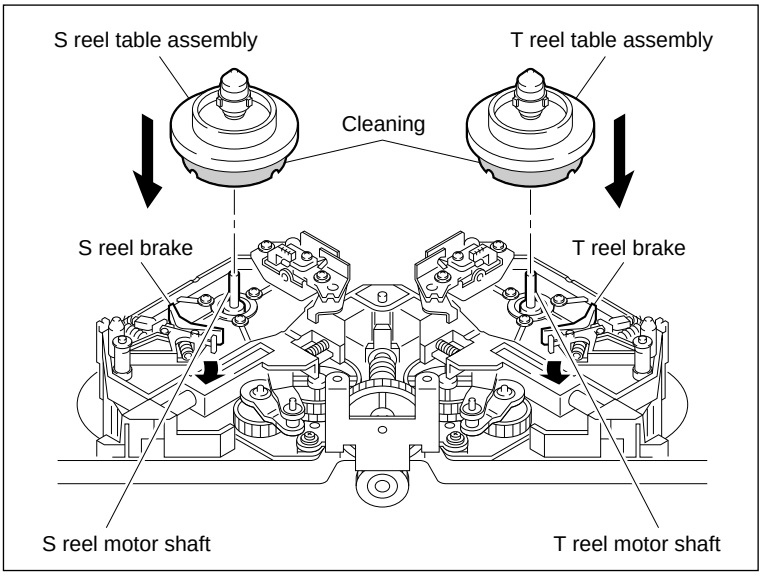
Refer to Section 3-15-2.

19. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Install the Reel Table Assembly

20. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

21. Confirm the Reel Table Height

Refer to Section 3-13-1.

22. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

23. Confirm the Reel Brake Release

Refer to Section 3-13-3.

24. Confirm the Brake Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C021: S REEL BRAKE/C022: T REEL BRAKE)

3-17. Reel Shift Gear Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 in Section 3-15-1.)
2. Remove the Reel Shift Gear
3. Remove the Crank Gear
4. Install the Crank Gear
5. Install the Reel Shift Gear
6. Grease Smearing (Warm Gear)
7. Install the RS Table Block Assembly (Refer to procedures 9 through 13 in Section 3-15-1.)
8. Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height (Refer to Section 3-15-3.)

Notes

- This section describes the reel shift gear replacement. The replacement of the warm wheel, crank gear, and crank arm is also the same as for this replacement procedure.
- Procedures 3 and 4 are not required when the reel shift gear or warm wheel is replaced.
- Use a new stop washer when the reel shift gear, warm wheel, crank gear, and crank arm are replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Oil: 7-661-018-18
- Grease (SGL-601): 7-651-000-10
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the RS Table Block Assembly

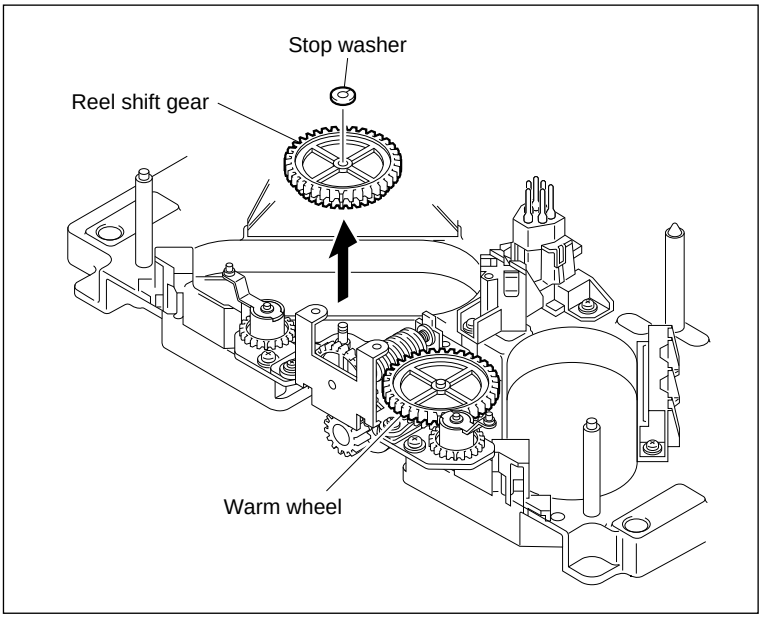
Remove the RS table block assembly with the reel table assembly attached.
(Refer to procedures 1 through 3 in Section 3-15-1.)

2. Remove the Reel Shift Gear

Remove the stop washer, then remove the reel shift gear.

Note

Do not reuse the stop washer.



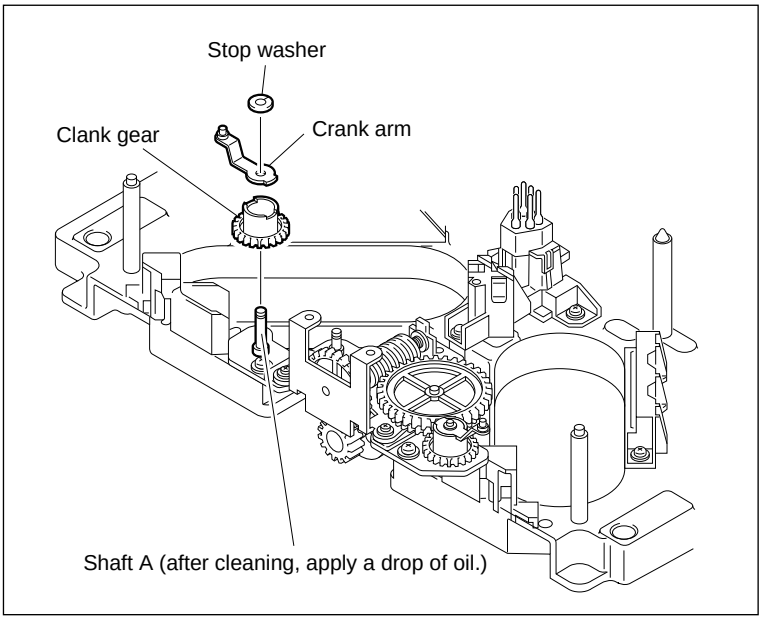
Remove the Reel Shift Gear

3. Remove the Crank Gear

(1) Remove the stop washer, then remove the crank gear.
(2) Take out the crank arm from the crank gear.

Note

Do not reuse the stop washer.



Remove /Install the Crank Gear

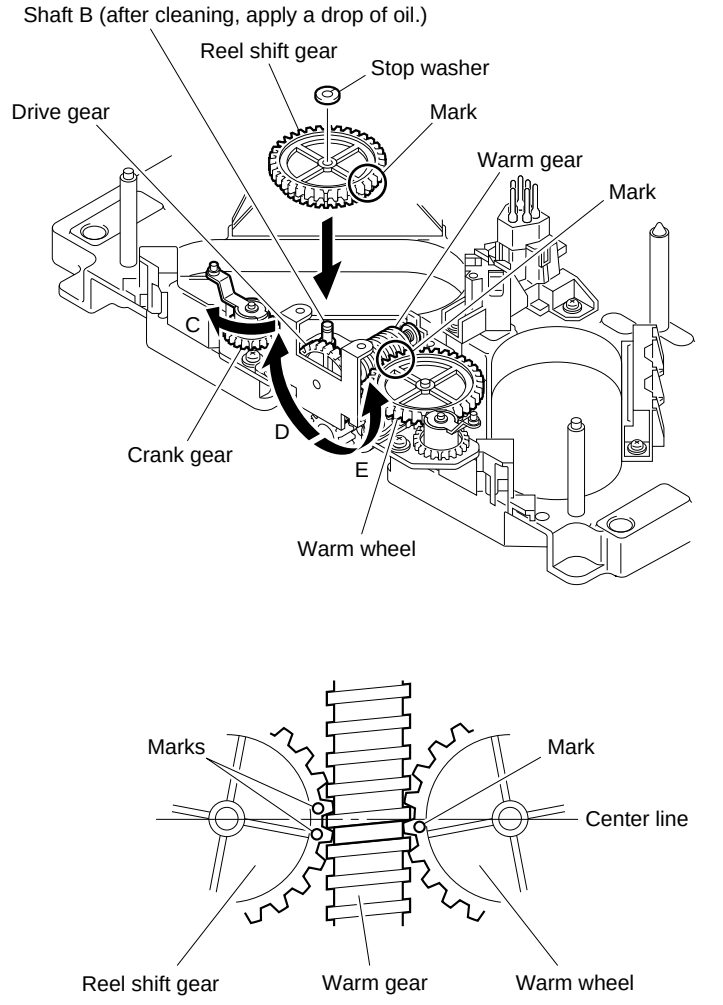
Installation

4. Install the Crank Gear Installation

(1) Clean shaft A.
(2) Apply one drop of oil to shaft A.
(3) Combine the crank arm with the crank gear.
(4) Pass the crank gear through the shaft A.
(5) Fix the crank gear using a new stop washer.

5. Install the Reel Shift Gear

(1) Clean shaft B.
(2) Apply one drop of oil to shaft B.
(3) Turn the crank gear fully in the direction indicated by arrow C.
(4) Turn the drive gear and put the mark of the warm wheel in the illustrated position.
(5) Align the mark of the reel shift gear with that of the warm wheel and pass the reel shift gear through shaft B while engaging it with the warm gear and crank gear.
(6) Rotate the drive gear in the direction indicated by arrow D by three to five turns, then rotate it fully in the direction of arrow E. At that time, confirm that the reel shift gear and warm wheel satisfy the specification.
(7) Fix the reel shift gear using a stop washer.



Spec. : The mark of the reel shift gear and the mark of the warm wheel are in the portion shown in the figure.

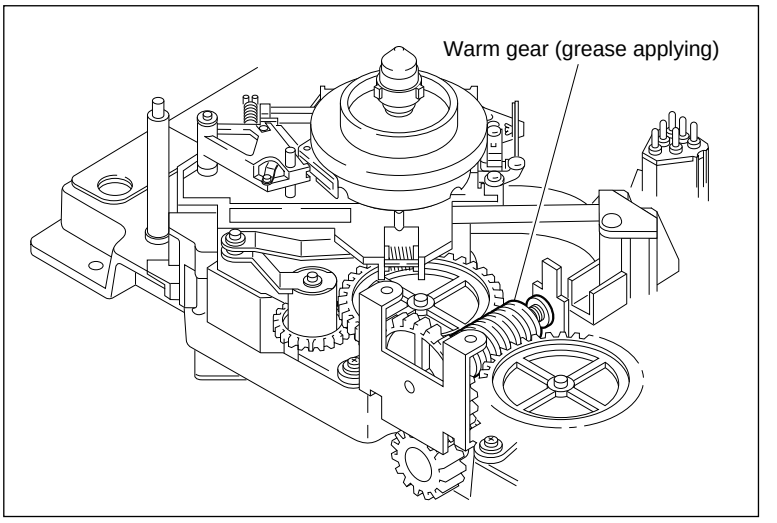
Install the Reel Shift Gear

6. Grease Smearing

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.

7. Install the RS Table Block Assembly

Refer to procedures 9 through 13 in Section 3-15-1.



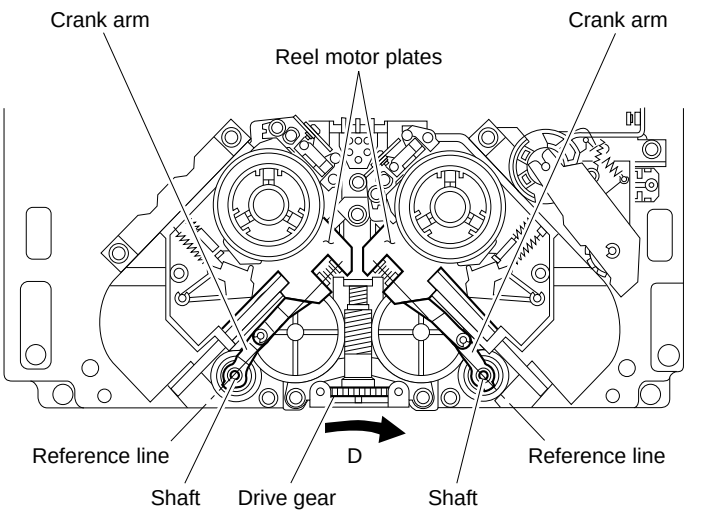
Grease Smearing

8. Confirm the Reel Shift Gear Operation

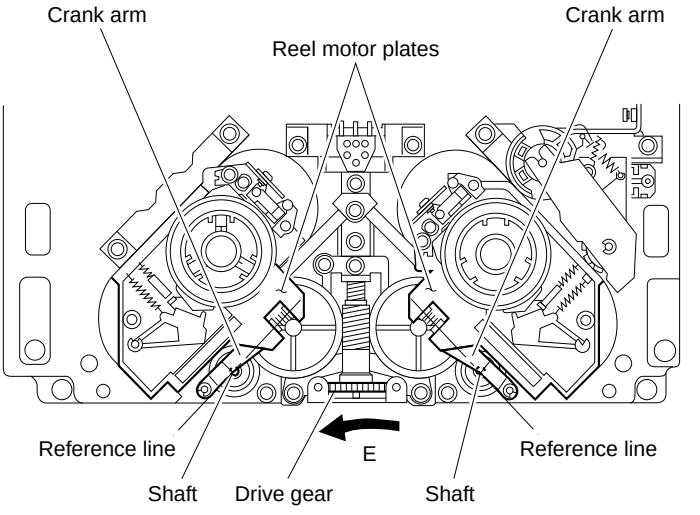
(1) Confirm that the crank arms on the supply and take-up sides operate in the same phase while turning the drive gear in the directions indicated by arrows D and E.

(2) Confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow D until it stops. (Fig. A) Similarly, confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow E until it stops. (Fig. B)

<Fig. A>



<Fig. B>



Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height

Refer to Section 3-15-3.

3-18. Reel Shift Motor Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 in Section 3-15-1.)
2. Remove the Reel Shift Assembly
3. Remove the M Gear
4. Remove the Reel Shift Motor
5. Remove the CCM-15 Board
6. Install the CCM-15 Board
7. Install the Reel Shift Motor
8. Install the M Gear
9. Install the Reel Shift Assembly
10. Grease Smearing (Warm Gear)
11. Install the RS Table Block Assembly (Refer to procedures 9 through 13 in Section 3-15-1.)

Adjustment after Replacement

12. Adjust the Cassette Pillar Height (Refer to Section 3-15-3.)
13. Check the Reel Shift Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.)
    (C016: REEL SHIFT MOTOR)

Notes

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver hexagonal bit (Across flat has 0.89 mm, l = 50 mm): J-6323-440-A
- Thickness gauge: 9-911-053-00
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Locking compound : 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

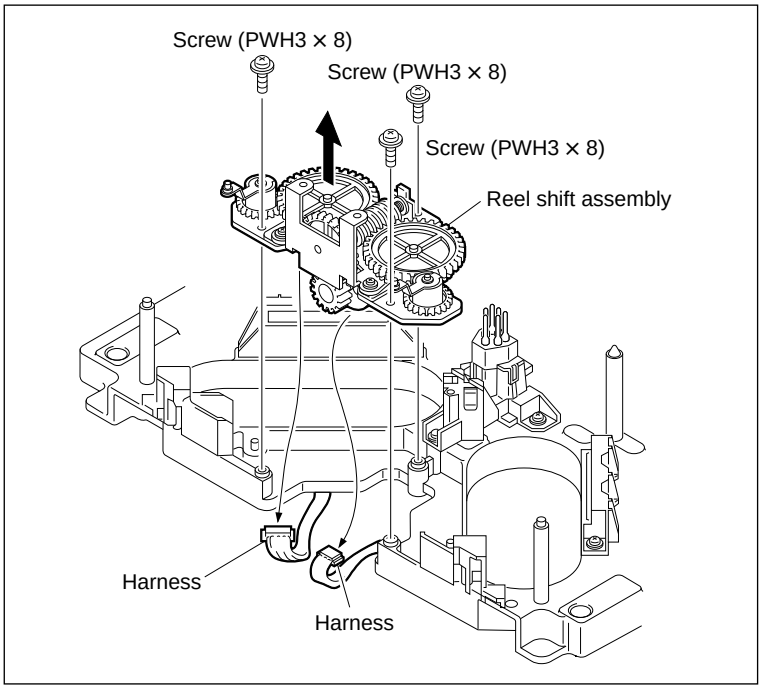
Removal

1. Remove the RS Table Block Assembly

Remove the RS table block assembly on the supply and take-up sides with the reel table assembly attached. (Refer to procedures 1 through 3 in Section 3-15-1.)

2. Remove the Reel Shift Assembly

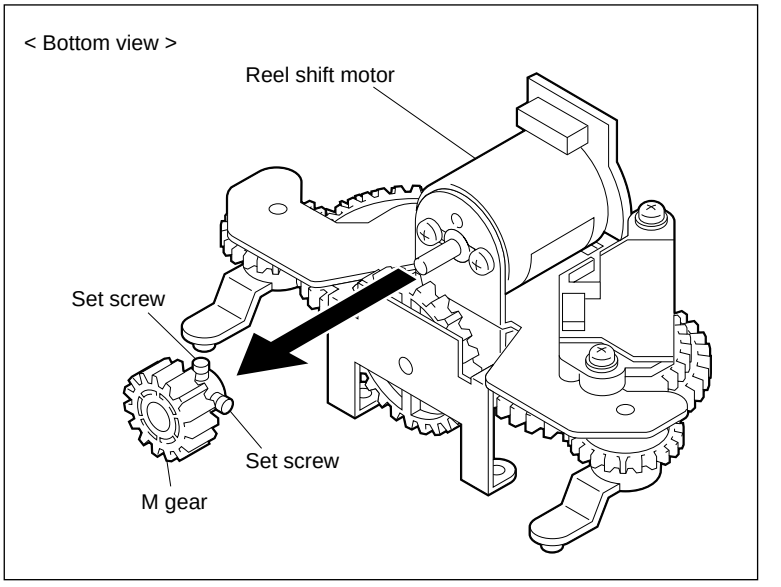
(1) Remove the three screws.
(2) Raise the reel shift assembly and disconnect the two harness shown in the figure.



Remove the Reel Shift Assembly

3. Remove the M Gear

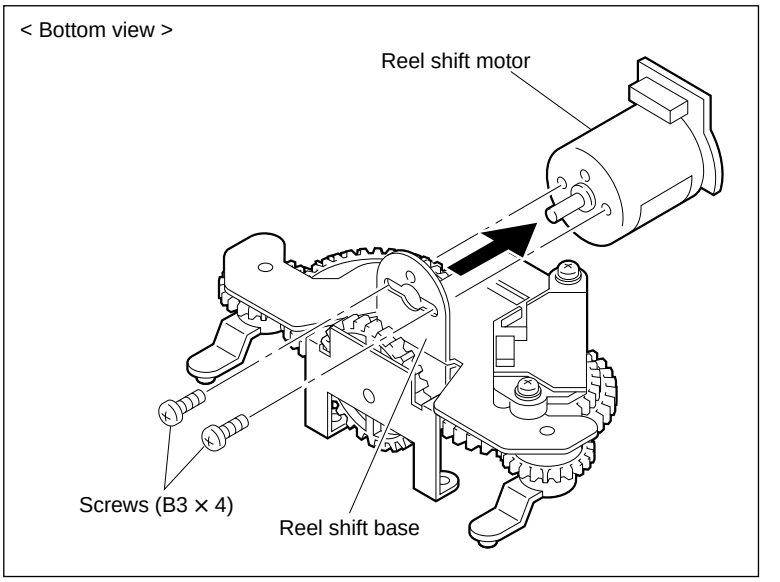
(1) Loosen the two set screws shown in the figure.
(2) Pull out the M gear from the shaft.



Remove the M Gear

4. Remove the Reel Shift Motor

Remove the two screws, then remove the reel shift motor from the reel shift base.



Remove the Reel Shift Motor

5. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board from the reel shift motor.

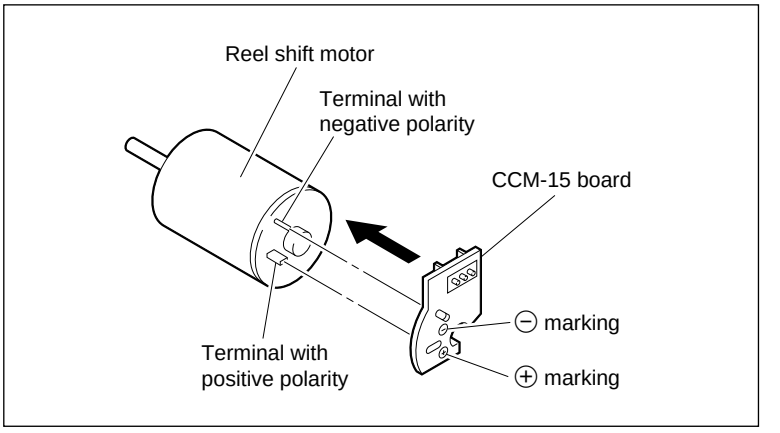
Installation

6. Install the CCM-15 Board

Pass the terminals of a new motor through the CCM-15 board, then solder.

Note

Solder so that no clearance exists between the motor and CM-15 board.

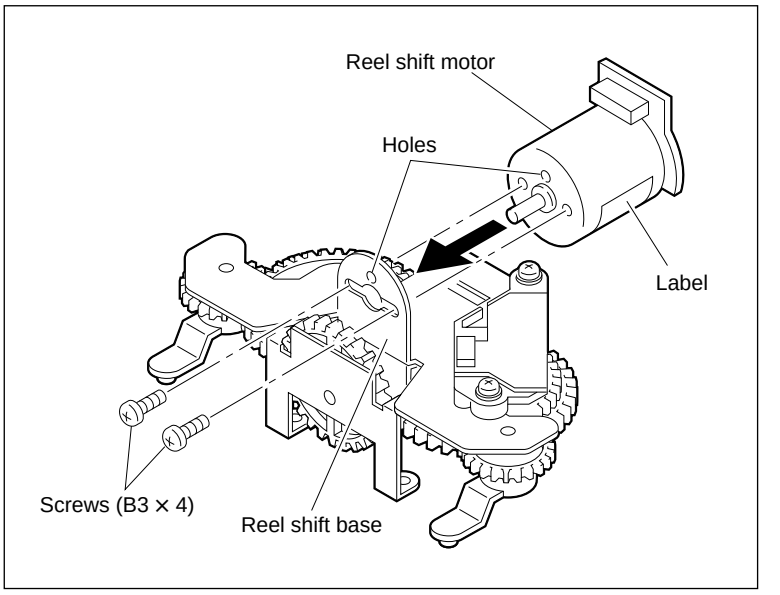


Remove /Install the CCM-15 Board

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7. Install the Reel Shift Motor

(1) Align the position of the reference hole of the motor with that of the reel shift base and tighten the two screws.
(2) Apply locking compound slightly to the screws.



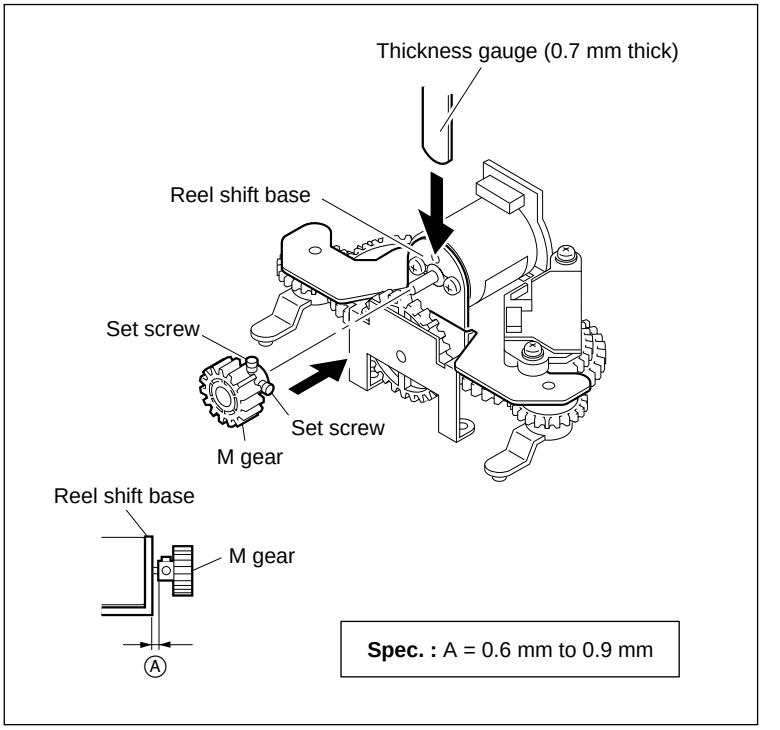
Install the Reel Shift Motor

8. Install the M Gear

(1) Pass the M gear through the shaft of the motor.
(2) Put a thickness gauge (0.7 mm thick) between the M gear and reel shift base.
(3) Tighten the two set screws while pushing the M gear toward the reel shift base.

Tightening torque: 18.6×10^{-2} N • m
(1.9 kgf • cm)

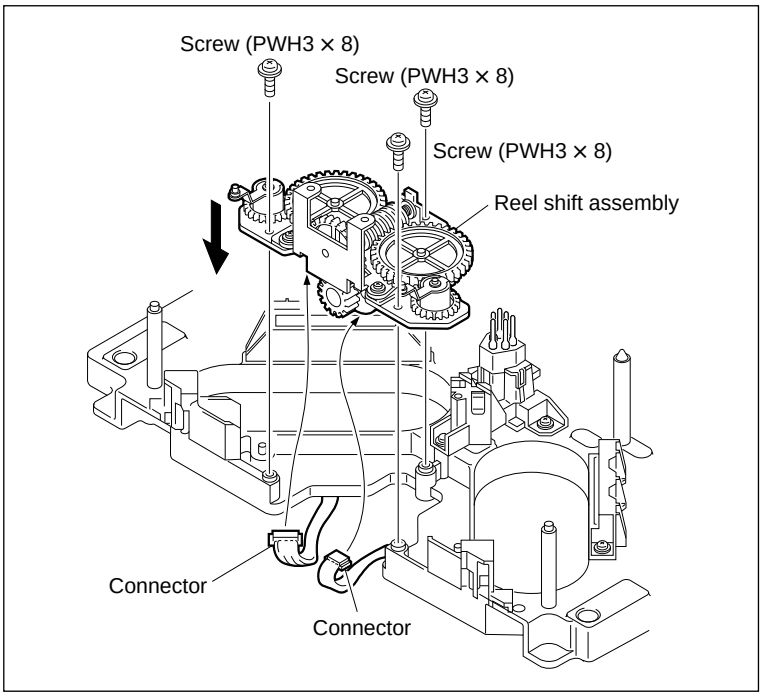
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the M gear and reel shift base satisfies the specification when the M gear is pushed toward the reel shift base.



Install the M Gear

9. Install the Reel Shift Assembly

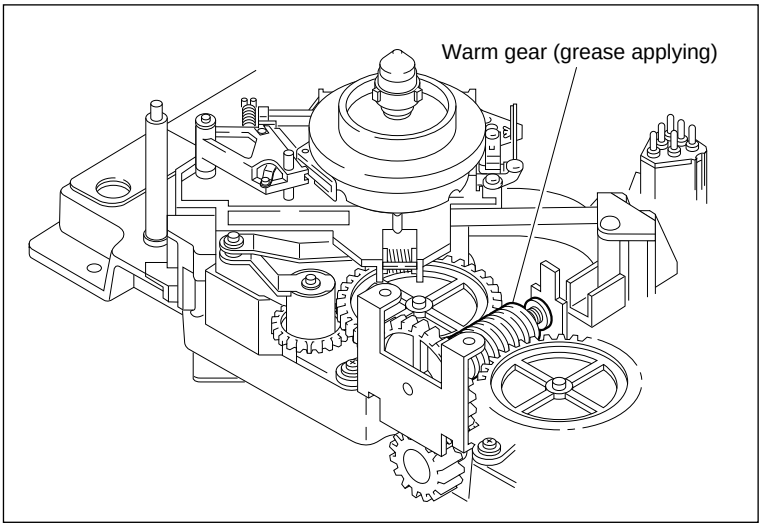
(1) Connect the two harness disconnected in procedure 2 to the reel shift assembly.
(2) Tighten the three screws.



Install the Reel Shift Assembly

10. Grease Smearing

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.



Grease Applying

11. Install the RS Table Block Assembly

Refer to procedures 9 through 13 in Section 3-15-1.

Adjustment after Replacement

12. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

13. Check the Reel Shift Motor Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C016: REEL SHIFT MOTOR)

3-19. Tape Guide Replacement

Note

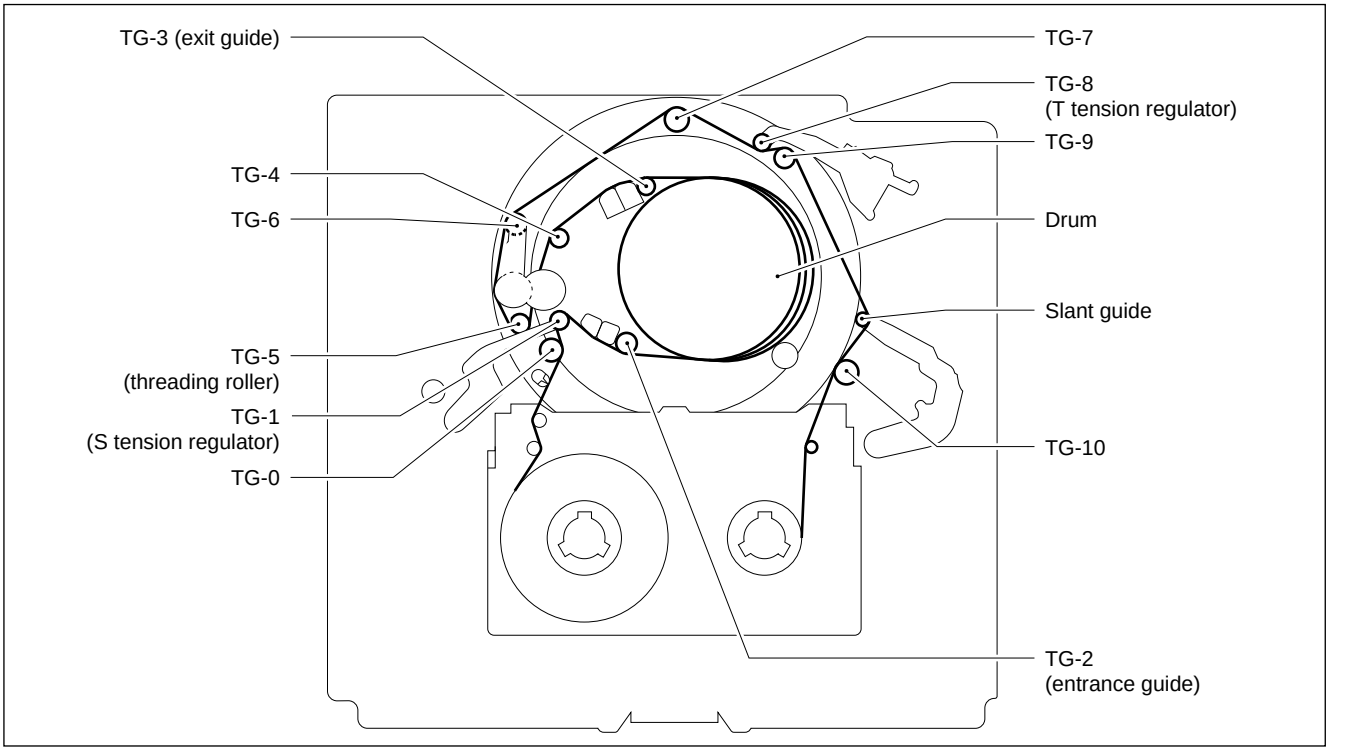
Be careful not to damage the drum when the tape guide roller is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Replacement

Perform the part replacement while referring to the exploded view.



Adjustment after Replacement

- Perform the following adjustments when any tape guide is replaced.
  ① Tape running adjustment (Refer to Section 4-1-2.)
  ② Video tracking confirmation (Refer to Section 4-1-3.)

- Perform the following adjustments when the slant guide is replaced.
  ① Slant guide slantness adjustment (Refer to Section 3-25-2.)
  ② Tape running adjustment (Refer to Section 4-1-2.)
  ③ Video tracking confirmation (Refer to Section 4-1-3.)

- Perform the following adjustments when the TG-2 or TG-3 is replaced.
  RF switching position adjustment
  (Refer to Section 4-2 of the maintenance manual part 1.)
  (A-011: RF SWITCHING POS.)

3-20. Tape Cleaner Replacement

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner. Never touch it with bare hands.

Outline

Replacement

1. Remove the Tape Cleaner
2. Install the Tape Cleaner

Note

The adjustment after tape cleaner replacement is not required.

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver bit (+2 mm, l = 75 mm): J-6323-420-A

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Removal

1. Remove the Tape Cleaner

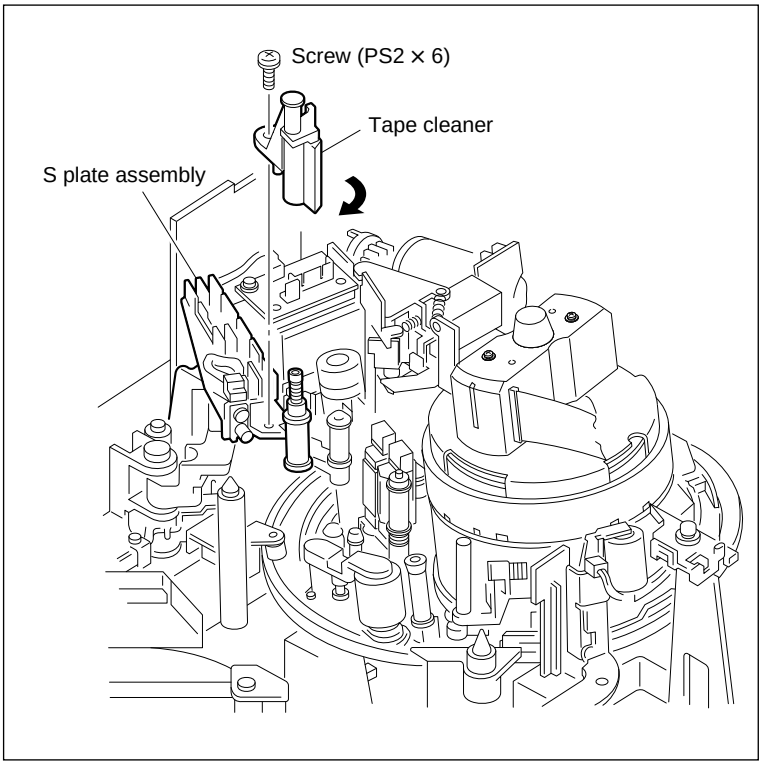
Remove the screw, then remove the tape cleaner from the S plate assembly.

Installation

2. Install the Tape Cleaner

Tighten the screw while moving a new tape cleaner clockwise.

Tightening torque: 19.6×10^{-2} N • m
(20 kgf • cm)



Remove/Install the Tape Cleaner

3-21. Gear Box Assembly and Threading Motor Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Remove the DT-34D Board
4. Remove the DR-315 Board
5. Disconnect the Harness
6. Remove the Gear Box Assembly
7. Remove the Threading Motor
8. Remove the CCM-15 Board
9. Install the CCM-15 Board
10. Install the Threading Motor
11. Install the Gear Box Assembly
12. Connect the Harness
13. Install the DR-315 Board
14. Install the DT-34D Board
15. Install the Shield Plate (Bottom)
16. Install the Bottom Plate

Adjustment after Replacement

17. Confirm the Threading Motor Operation (Refer to Section 4-2 maintenance manual part 1.) (C012: THREADING MOTOR)

Notes

- The gear box assembly supplied as repair parts may differ in two harness length from one used in this unit because of standardization of repair parts. When replacing the gear box assembly, replace the two harness by ones used in this unit according to the procedure described in this section.
- The threading motor, CCM-15 board, and gear box assembly can be replaced according to the procedure described in this section. Perform all the procedures when the threading motor or CCM-15 board is replaced. Perform procedures 1 through 6 and 11 through 17 when the gear box assembly is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assemby. (Refer to Section 2-5 of the maintenance manual part1.)

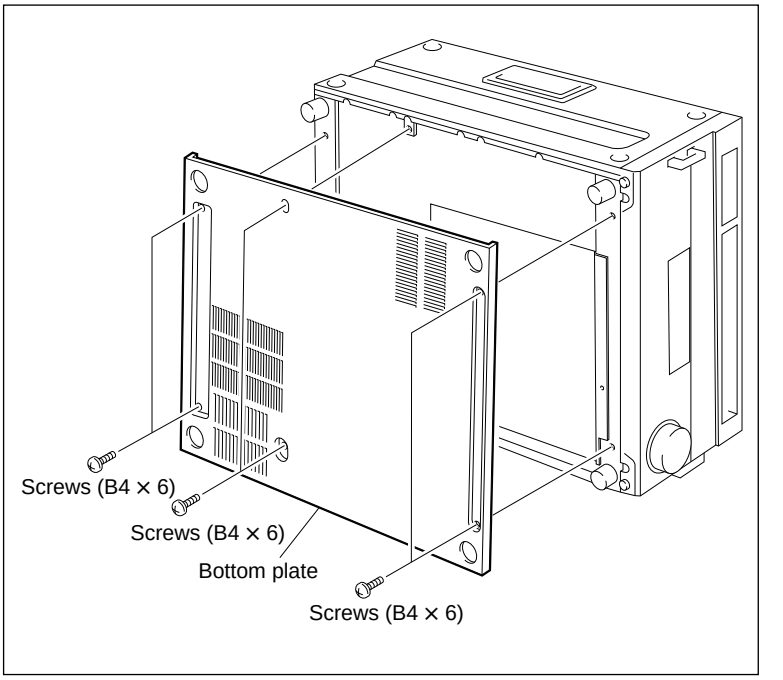
Tools

- L wrench (Across flat has 1.27 mm): 7-700-736-01
- Locking compound: 7-432-114-11
- Thickness gauge: 9-911-053-00

Removal

1. Remove the Bottom Plate

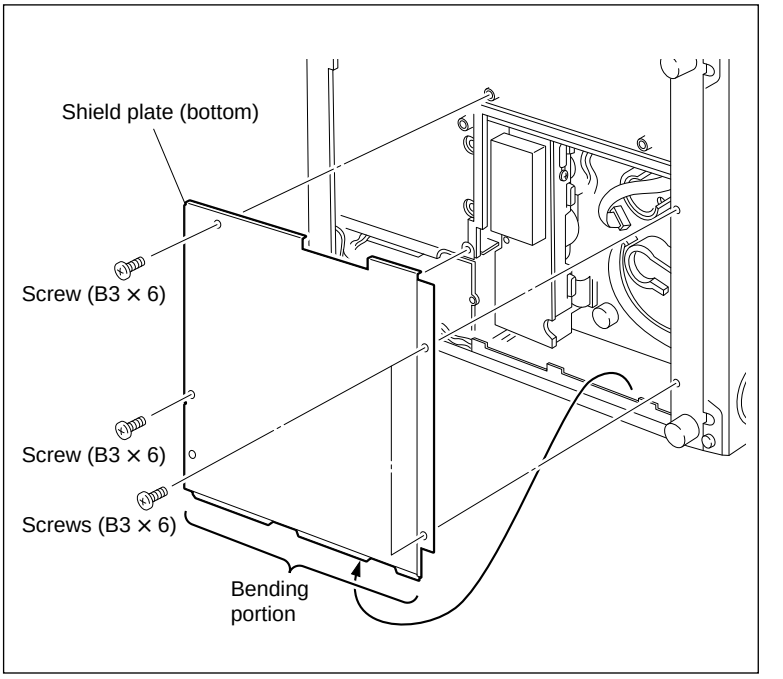
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

Remove the four screws, and then the shield plate (Bottom).



Remove the Shield Plate (Bottom)

3. Remove the DT-34D Board

Refer to procedure 2 in Section 3-12.

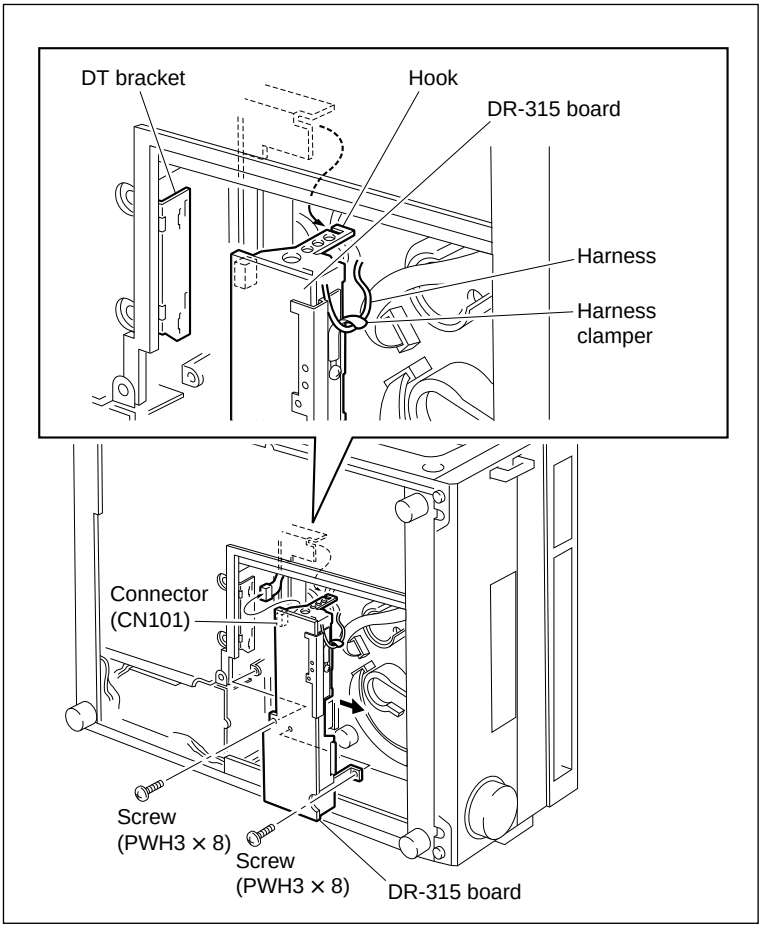
4. Remove the DR-315 Board

(1) Stretch the harness clamper on the DR-315 board and release the harnesses.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board toward the reel motors, and detach the hook.

Note

The hook is hard to be seen since it is the inner part.

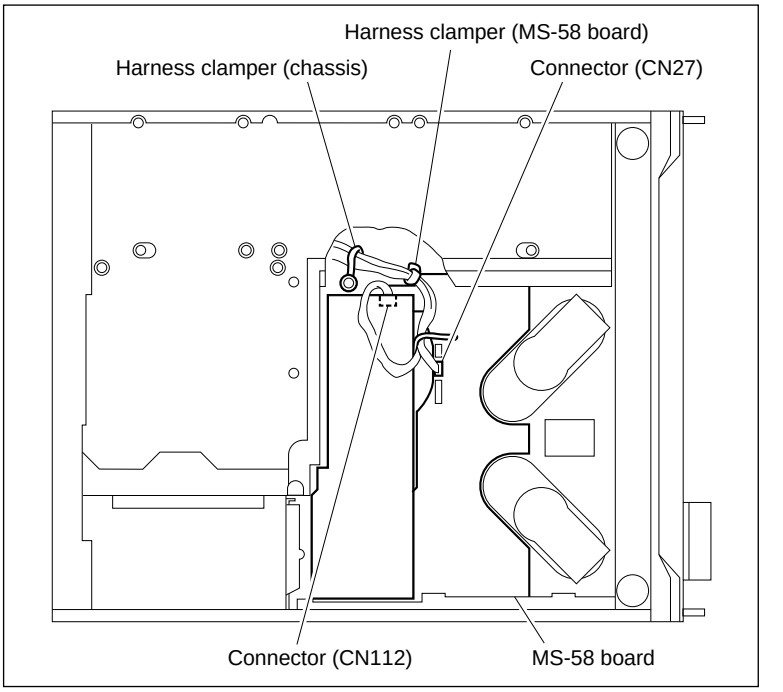
(4) Pull out the DR-315 board as far as possible as shown in the figure.



Remove the DR-315 Board

5. Disconnect the Harness

(1) Extend the two harness clampers shown in the figure.
(2) Disconnect the harness from the connector CN112 on the DR-315 board.
(3) Disconnect the harness from the connector CN27 on the MS-58 board.



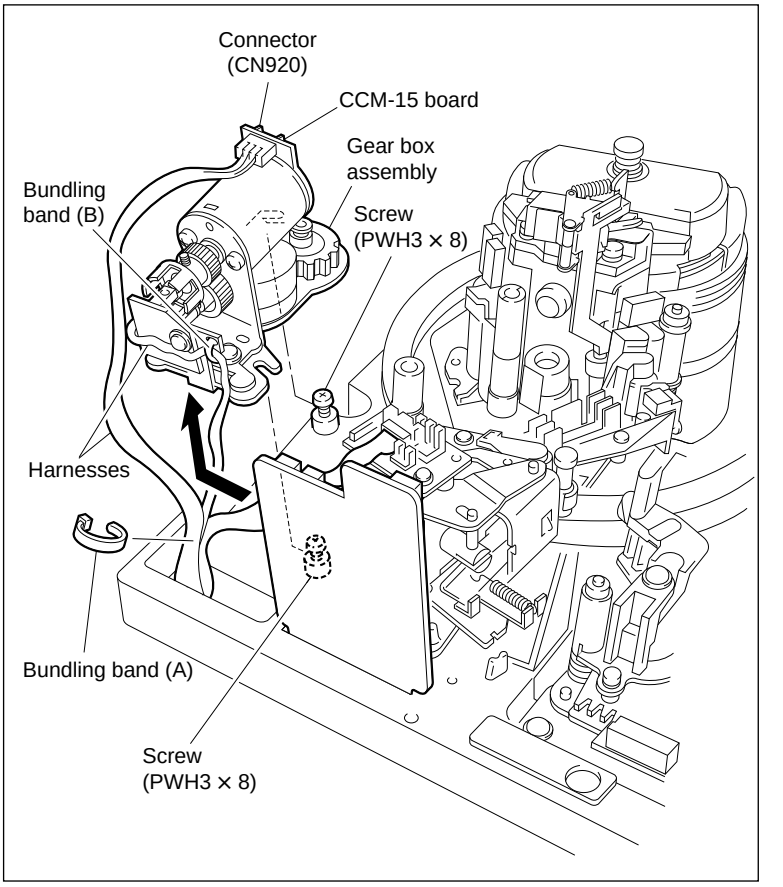
Disconnect the Harness

6. Remove the Gear Box Assembly

(1) Cut off the bundling band (A) shown in the figure.
(2) Remove the two screws and remove the gear box assembly.
(3) Cut off the bundling band (B) shown in the figure.
(4) Disconnect the two harness from the gear box assembly.

Reference

Procedures 7 through 10 are not required when the gear box assembly is replaced.



Remove the Gear Box Assembly

7. Remove the Threading Motor

(1) Loosen the set screw of the M gear.
(2) Remove the two screws fixing the motor.

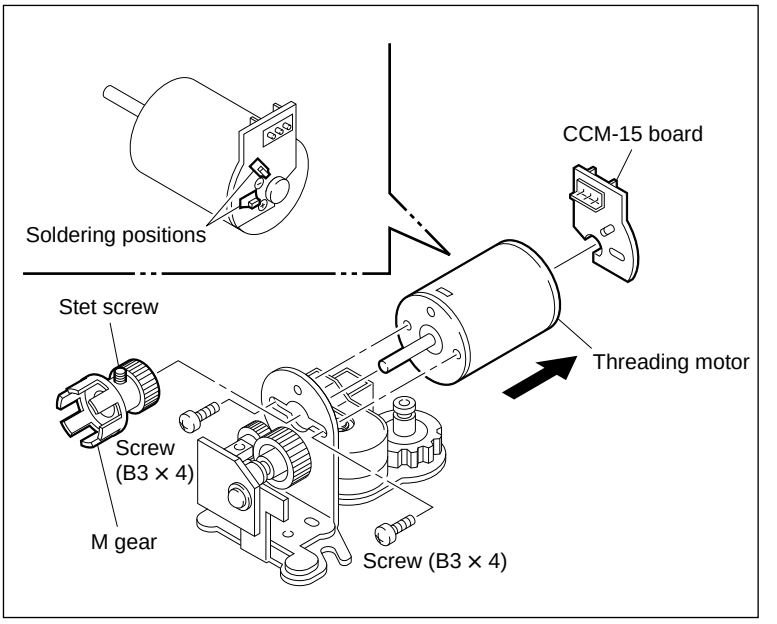
Note

Take care that the screwdriver does not strike against the M gear.

(3) Remove the motor. (The M gear can also be removed simultaneously.)

8. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board.



Remove the Threading Motor

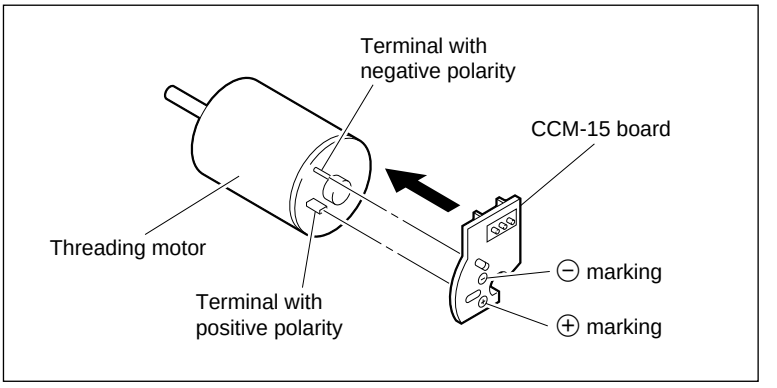
Installation

9. Install the CCM-15 Board

Pass the pins of the threading motor through the CCM-15 board and solder them.

Note

Solder so that no clearance exists between the motor and CCM-15 board.



Install the CCM-15 Board

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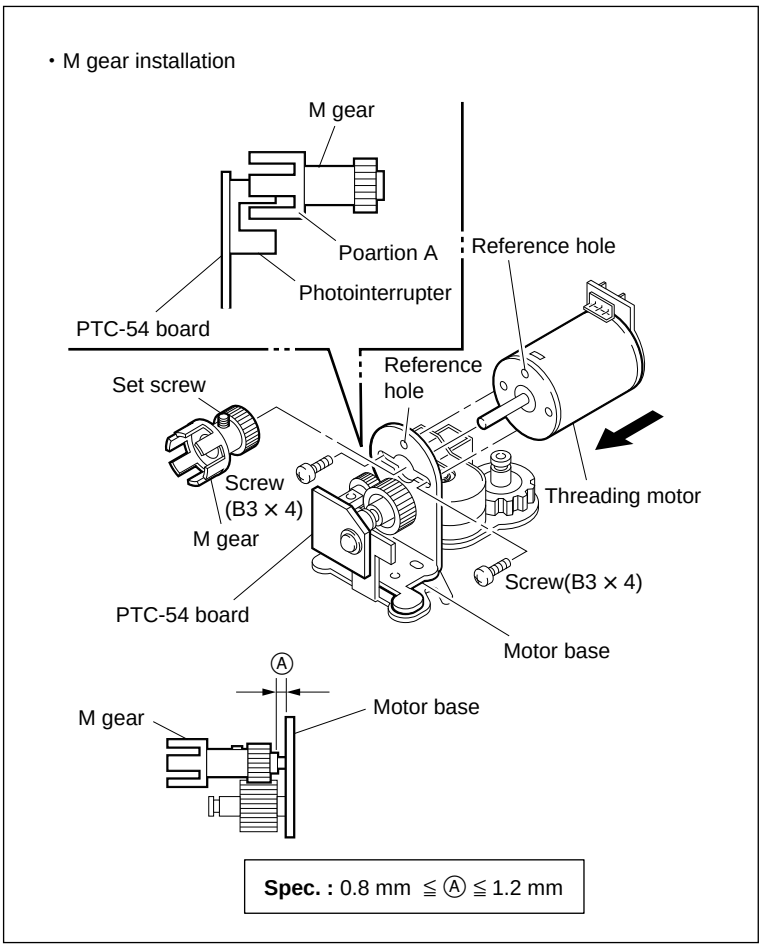
10. Install the Threading Motor

(1) Put portion A of the M gear into the photointerrupter on the PTC-54 board.
(2) Pass the motor shaft through the hole of the motor base and align the reference hole position of the motor with that of the motor base.
(3) Apply the locking compound slightly to the motor fixing screws and tighten them.

Note

Take care that the screwdriver does not strike against the M gear.

(4) Put the thickness gauge (1.0 mm thick) between the M gear and motor base.
(5) Tighten the set screw while pushing the M gear slightly toward the motor base.
(6) Pull out the thickness gauge.
(7) Confirm that the clearance between the M gear and motor base satisfies the specification when the M gear is pushed toward the motor base.
(8) Rotate the M gear manually and confirm that the M gear rotates smoothly. Moreover, confirm that the M gear does not touch the photointerrupter.



Install the Threading Motor

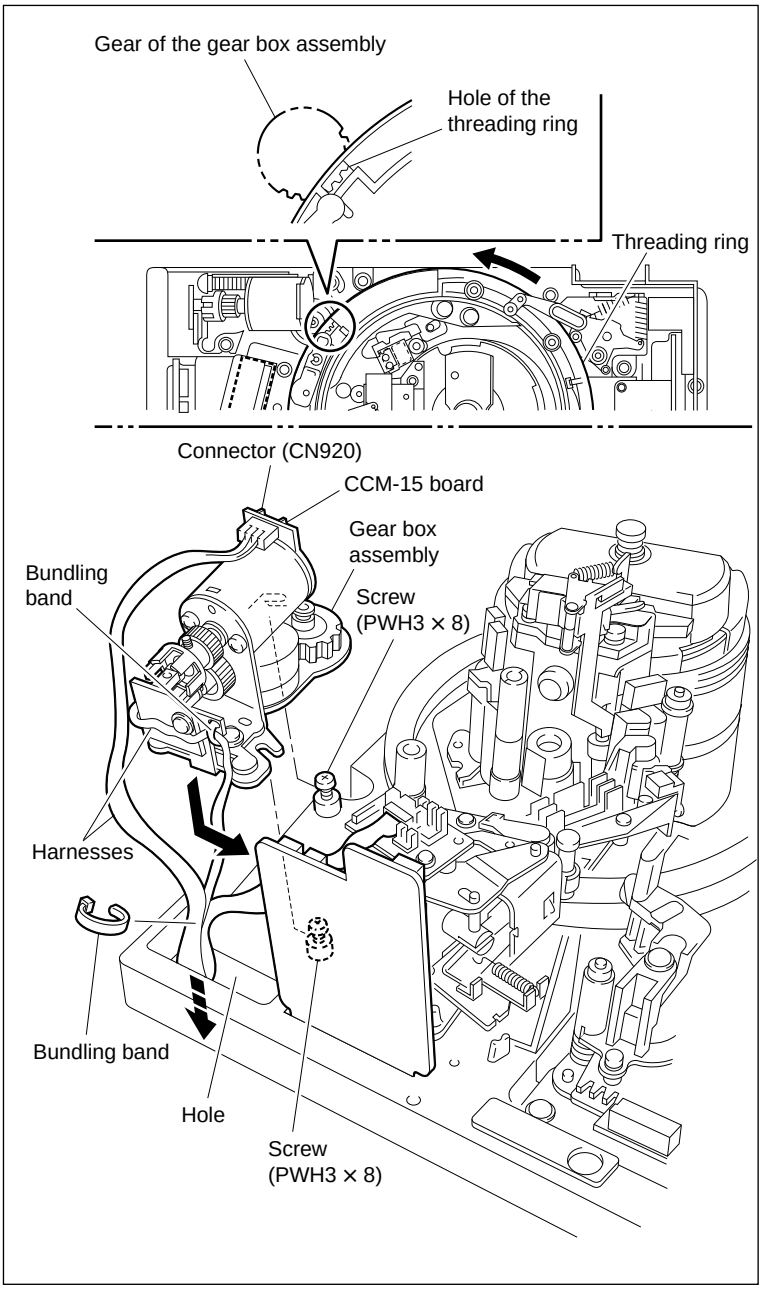
11. Install the Gear Box Assembly

(1) Disconnect the two harness from a new gear box assembly.
(2) Connect the two harness in (4) of procedure 6 to a new gear box assembly.
(3) Bundle the harness released in (3) of procedure 6 using a bundling band (or the equivalent).
(4) Rotate the threading ring so that the pinch roller places in front of the pinch solenoid.

Note

Move the hole of the threading ring to confirm the engagement of the gear when the gear box assembly is installed.

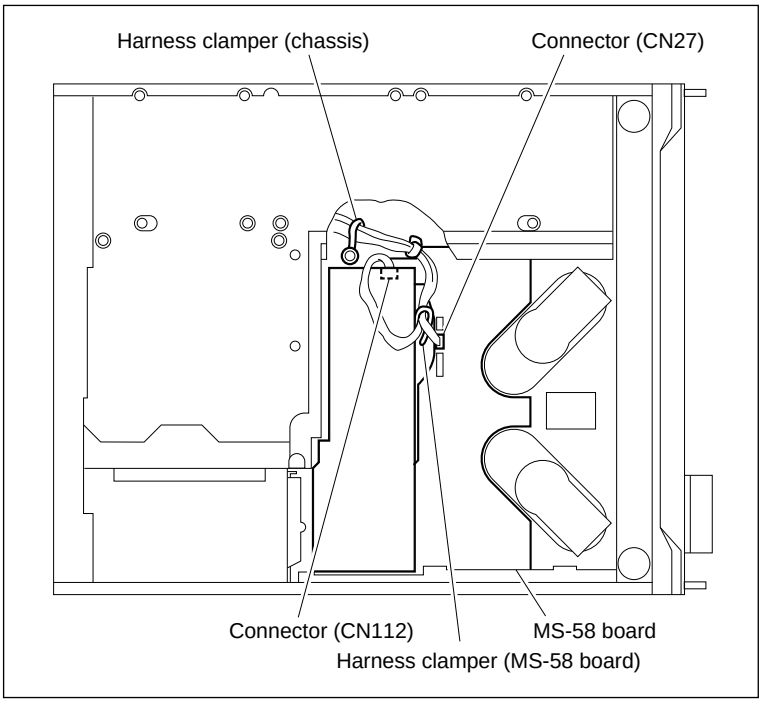
(5) Push the gear of the gear box assembly against that of the threading ring.
(6) Confirm from the hole of the threading ring that the gear of the gear box assembly engages with that of the threading ring.
(7) Tighten the screws while pushing the gear box assembly slightly toward the threading ring.
(8) Pass the two harness of the gear box assembly through the rear side from the hole of the mechanical deck, and put them to the rear side of the mechanical deck.
(9) Bundle the harnesses using the bundling bands (or the equivalent).



Install the Gear Box Assembly

12. Connect the Harness

(1) Connect a harness (3-pin) to the connector CN27 on the MS-58 board.
(2) Connect a harness (2-pin) to the connector CN112 on the DR-315 board.
(3) Fix the harness using the two harness clampers (chassis).



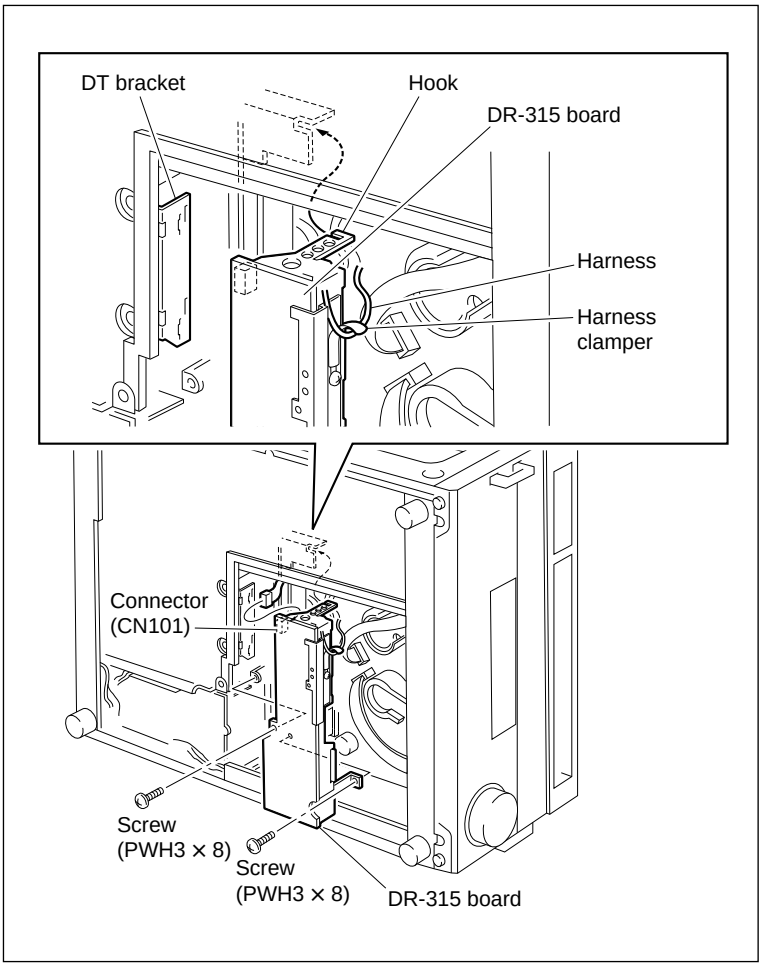
Connect the Harness

13. Install the DR-315 Board

(1) Put the hook of the DR-315 board into the notch of the chassis shown in the figure.
(2) Install the DR-315 board and tighten with the two screws.
(3) Clamp the harness released on the procedure 4-(1).

14. Install the DT-34D Board

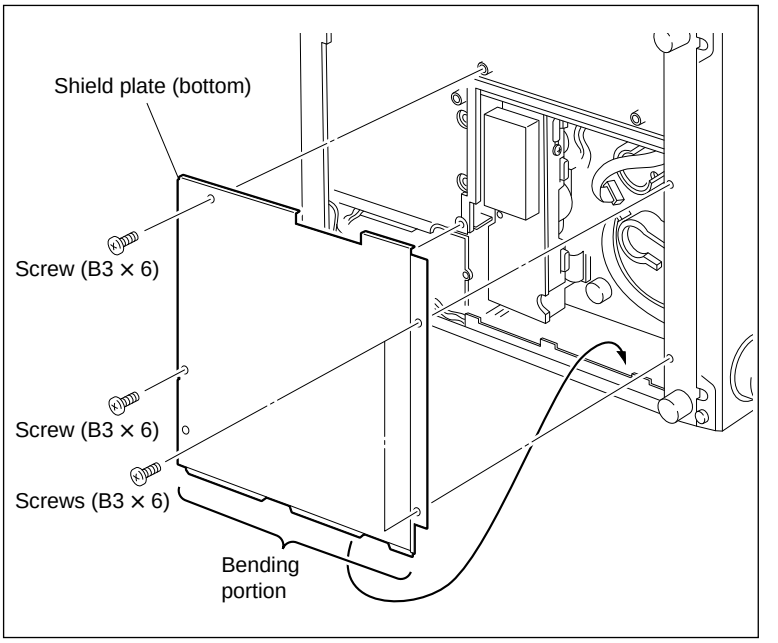
Refer to procedure 9 in Section 3-12.



Install the DR-315 Board

15. Install the Shield Plate (Bottom)

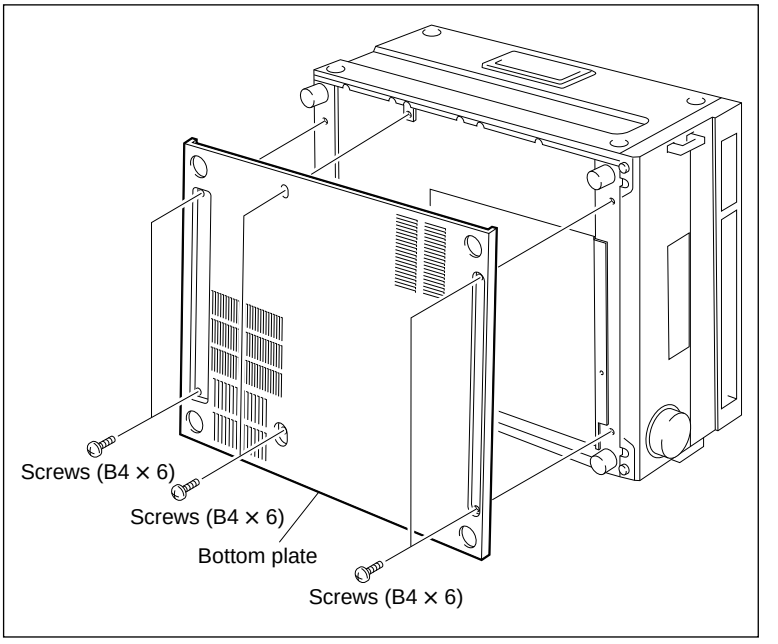
Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

16. Install the Bottom Plate

Tighten the bottom plate with six screws.



Install the Bottom Plate

Adjustment after Replacement

17. Confirm the Threading Motor Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C012: THREADING MOTOR)

3-22. Threading Ring and Ring Roller Replacement

Outline

Replacement

1. Remove the Flexible Board (CN2/SE-461 Board)
2. Disconnect the Harness (AT Head Board)
3. Remove the Pinch Arm Guard
4. Remove the CL Guide Rail
5. Remove the Pinch Pressure Assembly
6. Remove the S Plate Assembly
7. Remove the S Tension Regulator Assembly
8. Disconnect the Harness (Demagnetization Head Assembly)
9. Remove the T Drawer Assembly
10. Remove the Gear Box Assembly (Refer to Procedures 1 through 5 in Section 3-21.)
11. Remove the Ring Roller
12. Remove the Threading Ring Assembly
13. Install the Ring Roller (A) and (C)
14. Cleaning (Threading Ring Assembly)
15. Install the Threading Ring Assembly
16. Install the Ring Roller (B)
17. Install the Gear Box Assembly (Refer to Procedures 11 through 17 in Section 3-21.)
18. Confirm the Threading Ring Operation
19. Install the S Plate Assembly
20. Install the Pinch Pressure Assembly
21. Put the Unit into the Unthreading End State.
22. Install the S Tension Regulator Assembly
23. Install the T Drawer Assembly
24. Confirm the T Drawer Assembly Operation
25. Install the CL Guide Rail
26. Confirm the CL Arm Assembly Operation
27. Install the Pinch Arm Guard
28. Connect the Flexible Board (CN2/SE-461 Board)
29. Connect the Harness (AT Head Board)
30. Connect the Harness (Demagnetization Head Assembly)
31. Pinch Pressure Clearance Adjustment (Refer to Section 3-11-2.)
32. Confirm the Tape Running (Refer to Section 4-1-2.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

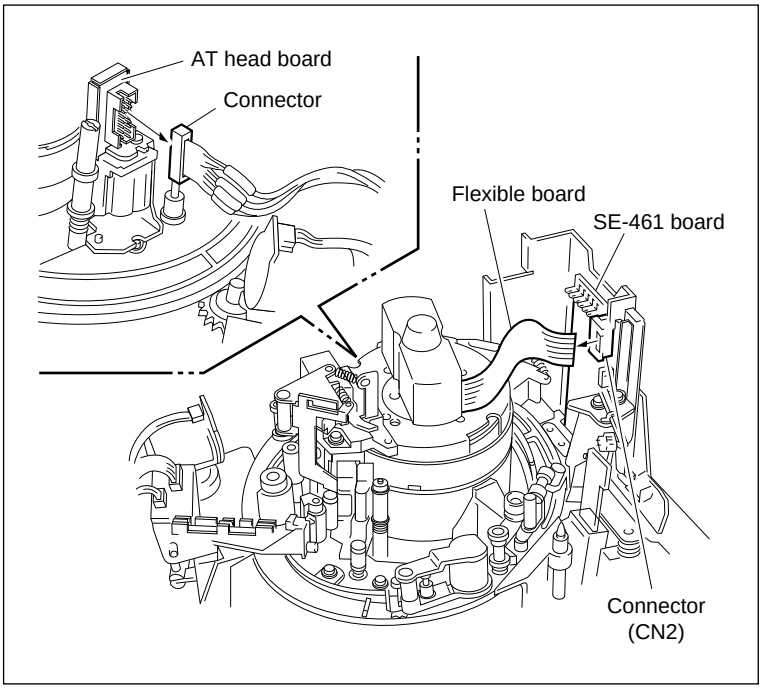
Removal

1. Remove the Flexible Board

Remove the flexible board from the connector CN2 on the SE-461 board.

2. Disconnect the Harness

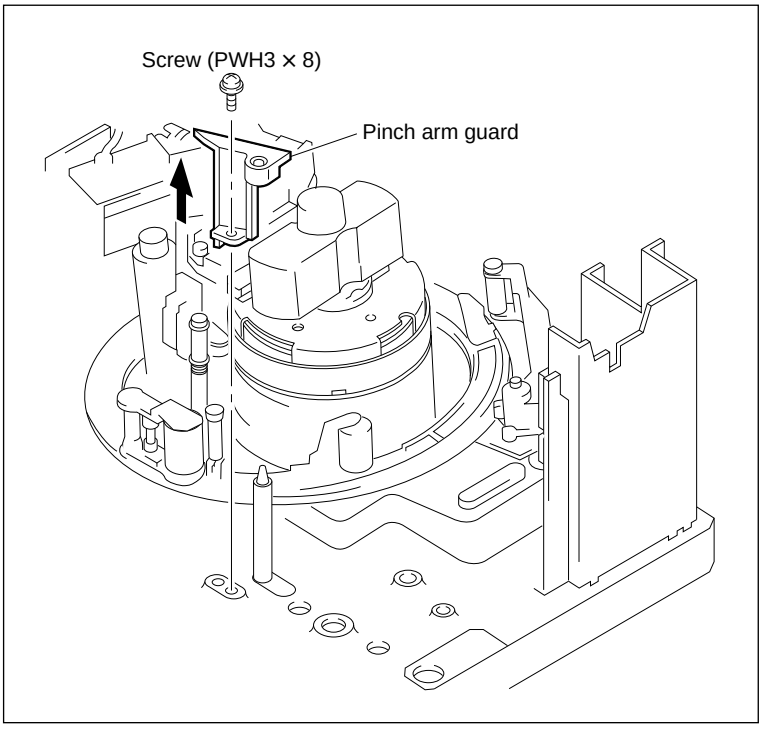
Disconnect the harness from the connector on the AT head board.



Remove the Flexible Board/Disconnect the Harness

3. Remove the Pinch Arm Guard

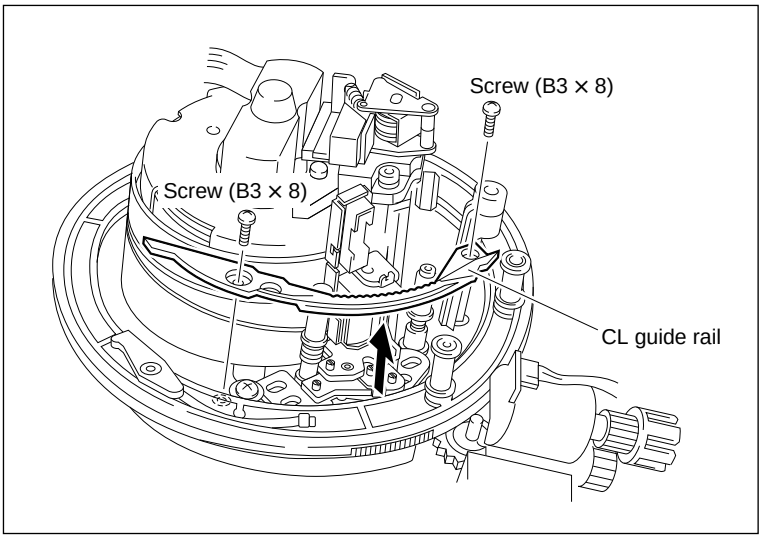
Remove the screw, then remove the pinch arm guard.



Remove the Pinch Arm Guard

4. Remove the CL Guide Rail

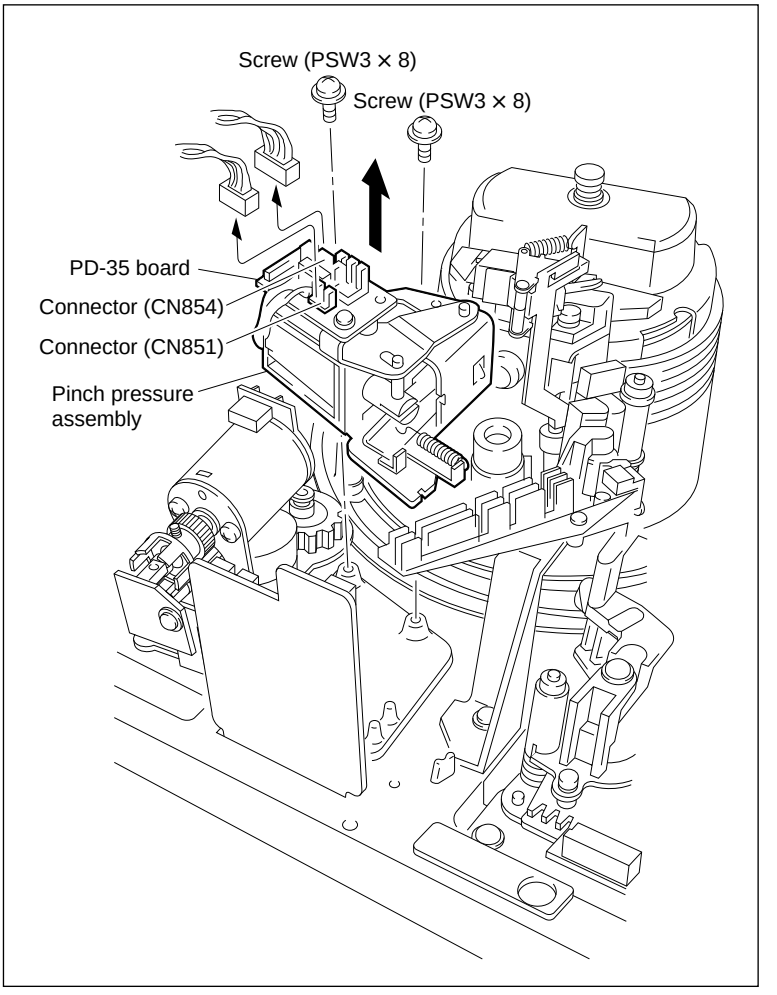
Remove the screws, then remove the CL guide rail.



Remove the CL Guide Rail

5. Remove the Pinch Pressure Assembly

(1) Disconnect the harness from the connector CN851 and CN854 on the PD-35 board.
(2) Remove the two screws, then remove the pinch pressure assembly.



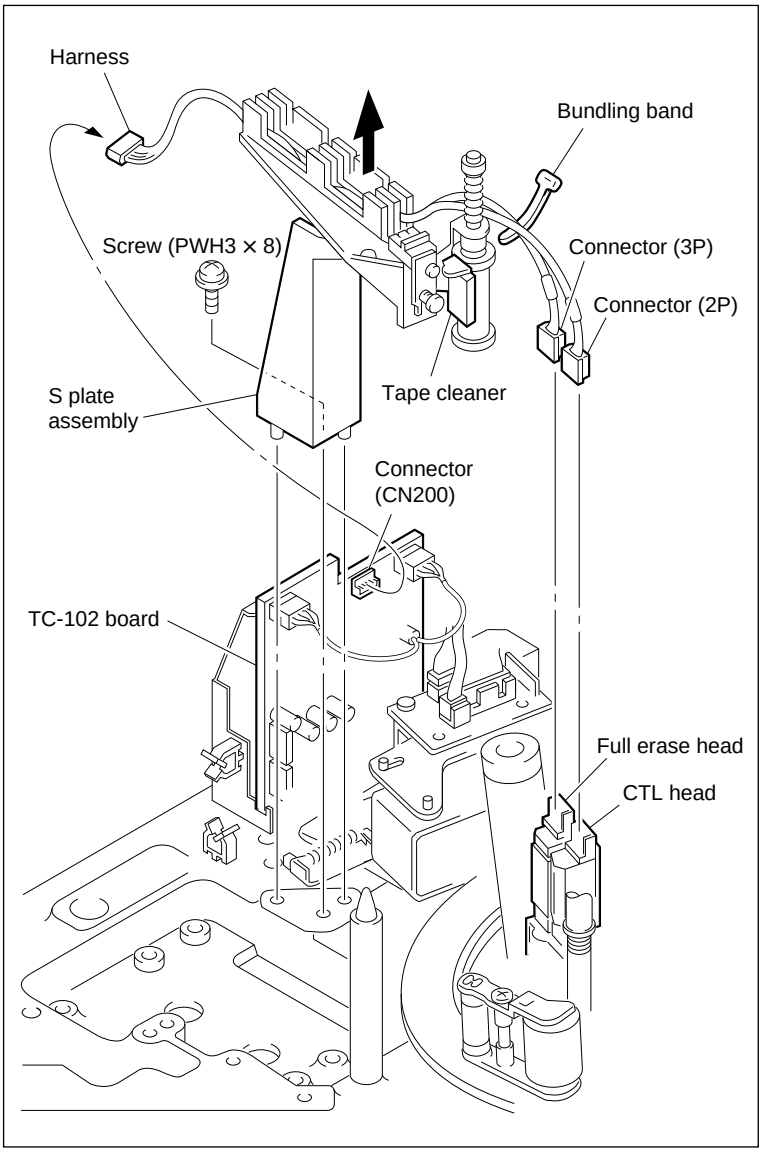
Remove the Pinch Pressure Assembly

6. Remove the S Plate Assembly

(1) Remove the bundling band and disconnect the harness from the connector CN200 on the TC-102 board.
(2) Remove the bundling band and disconnect the harness from the connectors on the CTL head board and the full-erase head board.
(3) Remove the screw, then remove the S plate assembly.

Note

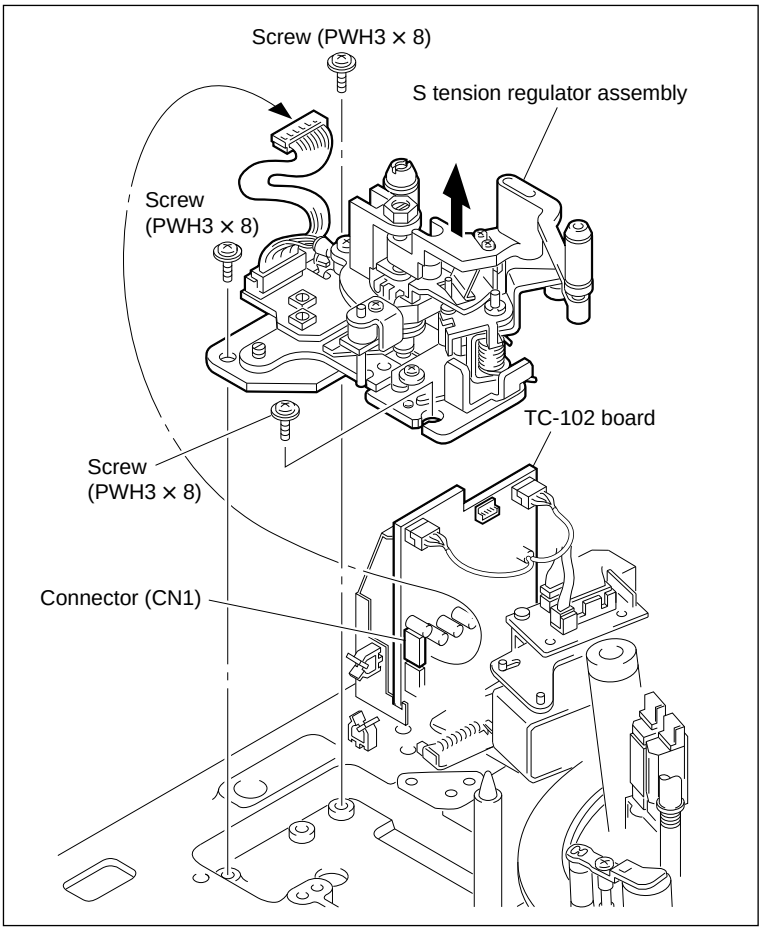
The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.



Remove the S Plate Assembly

7. Remove the S Tension Regulator Assembly

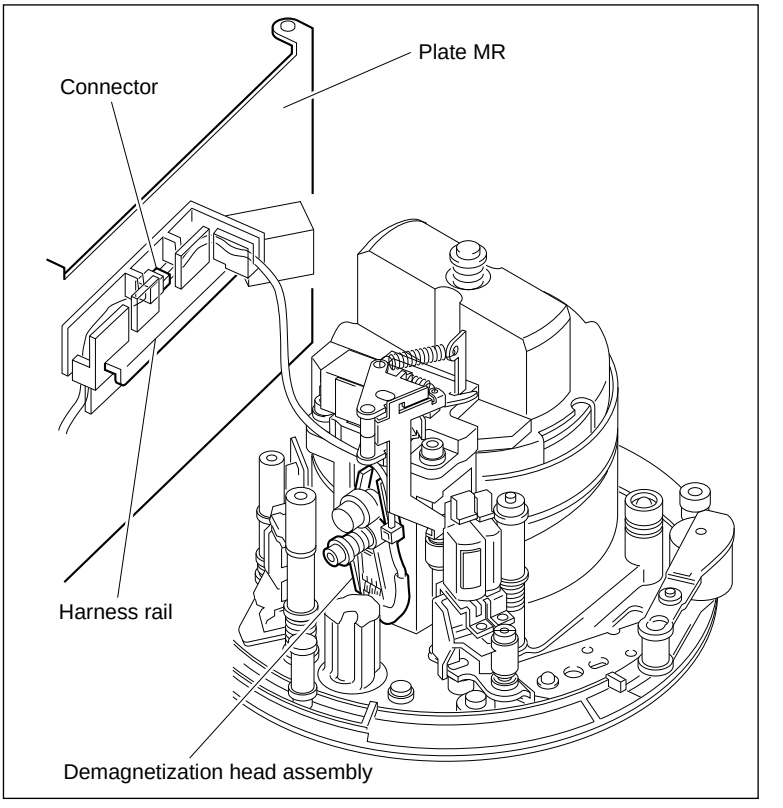
(1) Disconnect the harness from the connector CN1 on the TC-102 board.
(2) Remove the three screws, then remove the S tension regulator assembly.



Remove the S Tension Regulator Assembly

8. Disconnect the Harness

Disconnect the connector of demagnetization head assembly on the harness rail.



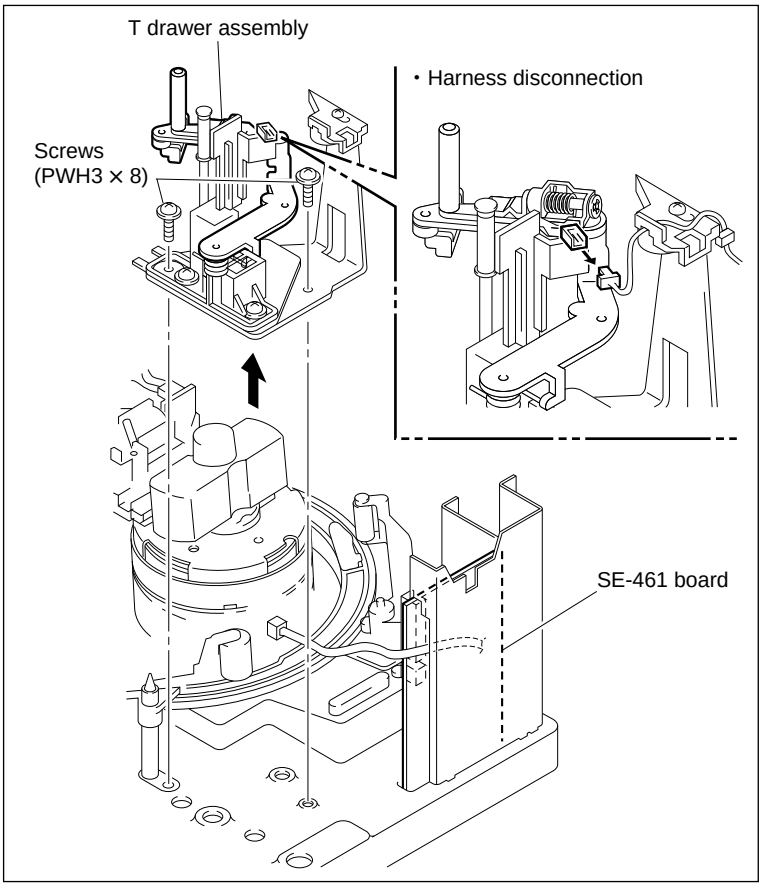
Disconnect the Harness

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9. Remove the T Drawer Assembly

(1) Disconnect the harness from the connector of the tape top sensor.

(2) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

10. Remove the Gear Box Assembly

Refer to procedures 1 through 5 in Section 3-21.

11. Remove the Ring Roller

(1) Remove the screws, then remove the ring rollers (A) and (B).

Note

Be careful not to touch the drum (especially, video heads).

(2) Move the threading ring in the direction indicated by the arrow.
(3) Remove the screw, then remove the ring roller (C).

Note

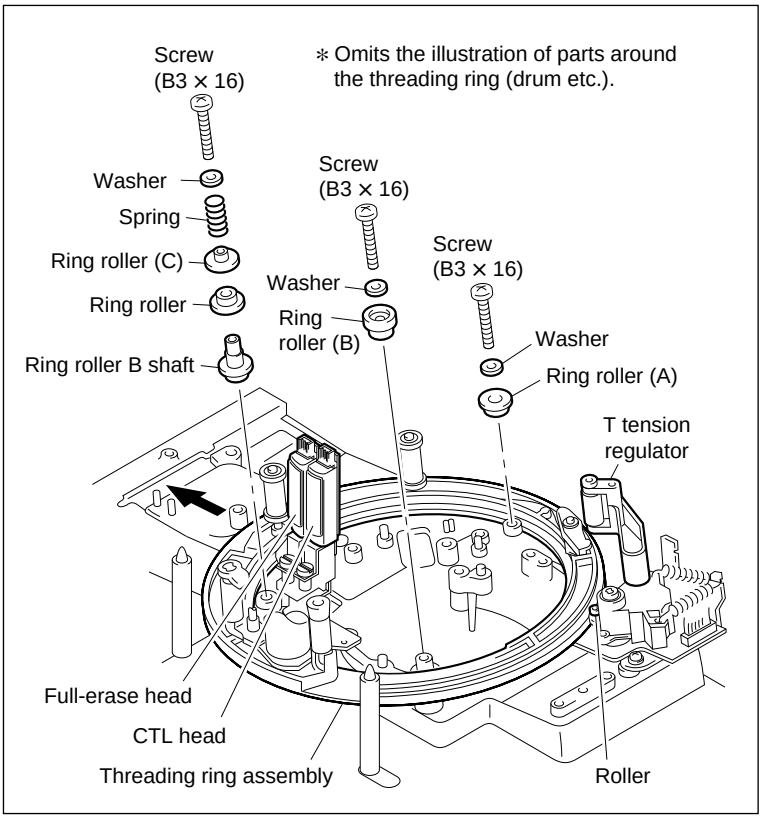
Be careful not to damage the CTL head or full-erase head.

12. Remove the Threading Ring Assembly

Remove the threading ring assembly from the chassis.

Note

Be careful not to damage the drum (especially, video heads or upper drum's tape running surface) and capstan motor shaft at that time.



Remove/Install the Ring Roller (C)

Installation

13. Install the Ring Roller (A) and (C)

(1) Assemble parts in the order shown in the figure of procedure 10 and install the ring rollers (A) and (C) in the chassis.

Note

Be careful not to damage the CTL head or full-erase head.

14. Cleaning

Clean the inside of a new threading ring assembly with cleaning cloth moistened with cleaning fluid.

15. Install the Threading Ring Assembly

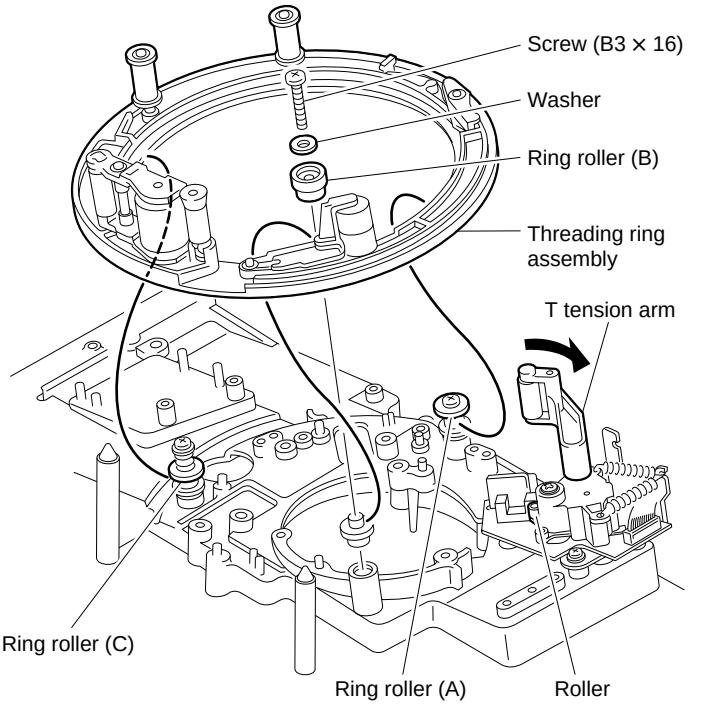
Push the T tension arm in the direction indicated by the arrow and install the threading ring assembly while putting it in the grooves of the ring rollers (A) and (C).

16. Install the Ring Roller (B)

(1) Pass the ring roller (B) through the roller shaft and tighten the screw while holding the threading ring assembly so that it is not dislocated from the grooves of the ring rollers (A) and (C).

(2) Confirm that the threading ring assembly is put between the three ring rollers. Moreover, confirm that the T tension regulator roller is not dislocated from the side of the threading ring.

∗ Omits the illustration of parts around the threading ring (drum etc.).



Install the Threading Ring Assembly

17. Install the Gear Box Assembly

Refer to procedures 11 through 17 in Section 3-21.

18. Comfirm the Threading Ring Operation

Turn the M gear of the gear box assembly for threading and unthreading directions, and confirm that the threading ring and three ring rollers rotate smoothly.

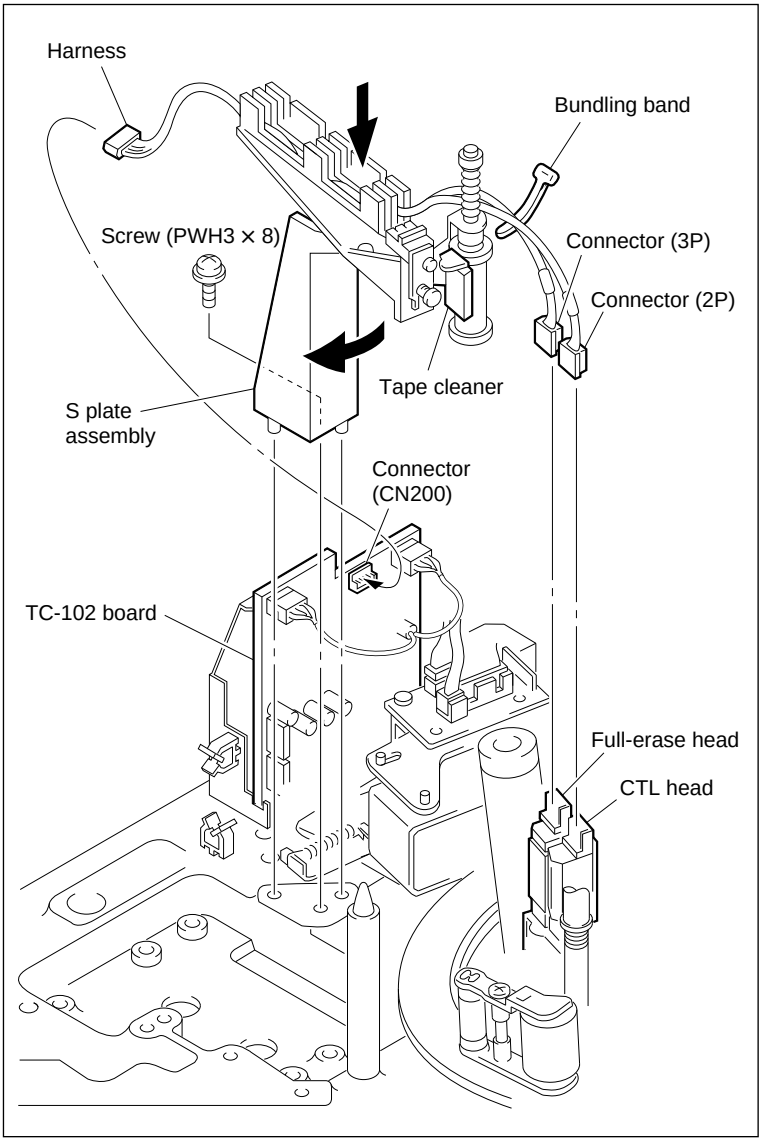
19. Install the S Plate Assembly

(1) Insert the pins of the S plate assembly into the holes of the chassis and tighten the screw while moving the S plate assembly clockwise.

Note

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

(2) Connect the harness to the connector CN200 on the TC-102 board.
(3) Fix the harness using a bundling band (or the equivalent).
(4) Connect the harness to the connectors on the CTL head board and full-erase head board.
(5) Fix the harness using a bundling band (or the equivalent).

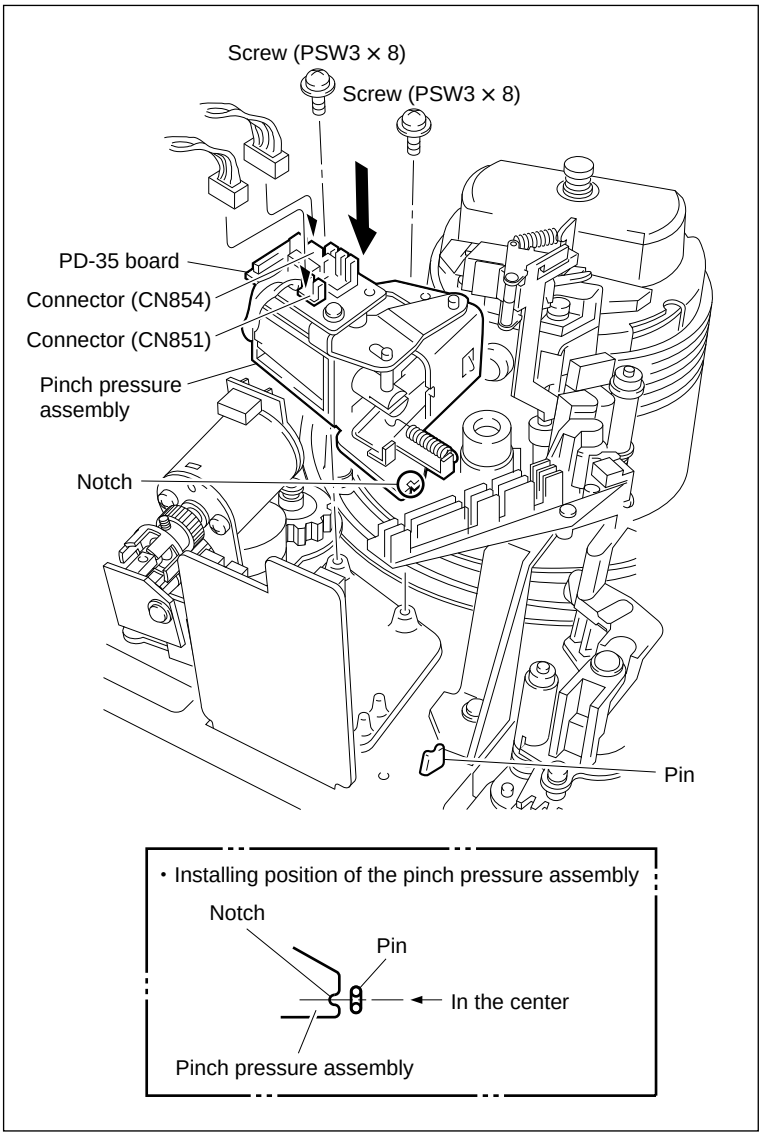


Install the S Plate Assembly

20. Install the Pinch Pressure Assembly

(1) Align the notch of the pinch pressure assembly with the center of the pin of the chassis, and tighten the two screws.

(2) Connect the harness to the connectors CN851 and CN854 on the PD-35 board.

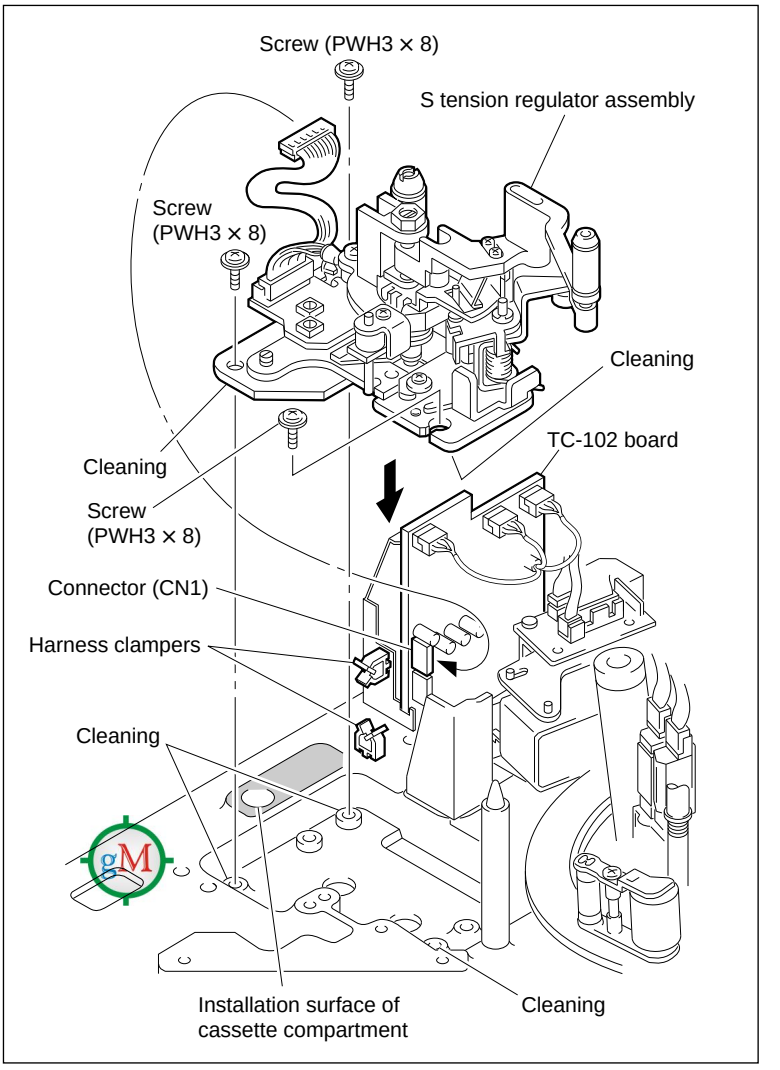


Install the Pinch Pressure Assembly

21. Put the Unit into the Unthreading End State.

22. Install the S Tension Regulator Assembly

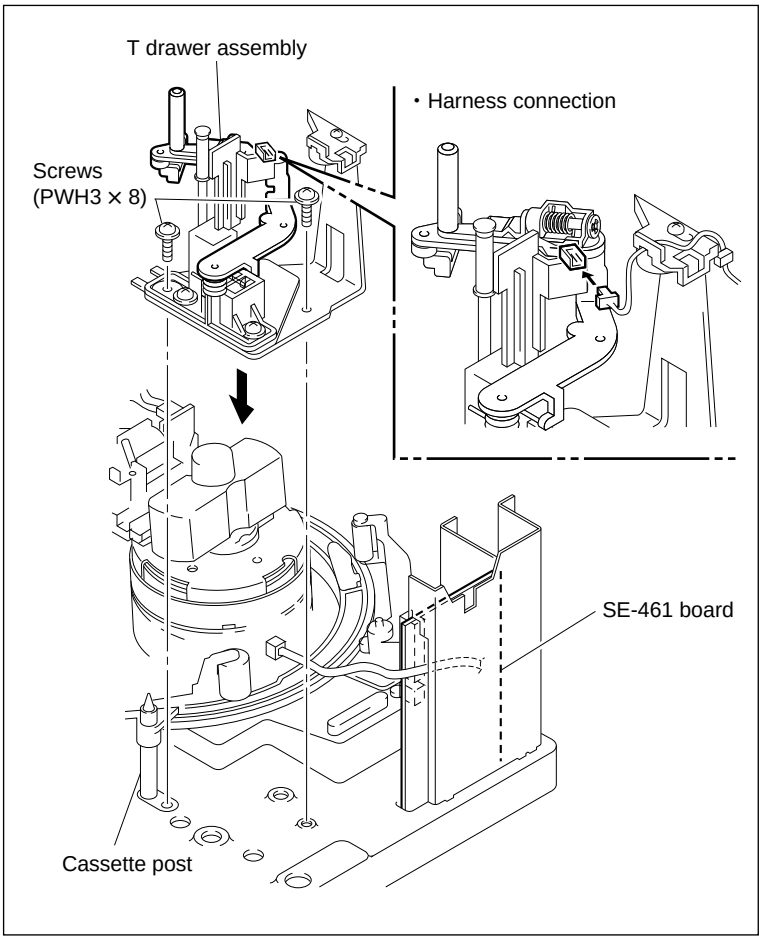
(1) Clean the installation surfaces of the S tension regulator assembly and chassis in the three portions.
(2) Set the S tension regulator assembly and tighten with the three screws.
(3) Connect the harness into the connector CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the installation surface (portion in the figure) of the cassette compartment.



Install the S Tension Regulator Assembly

23. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Install the T Drawer Assembly

24. Confirm the T Drawer Assembly Operation

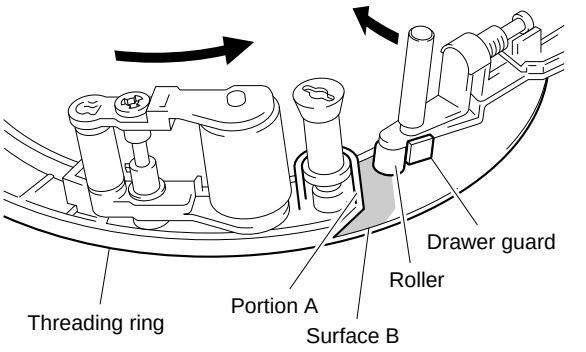
(1) Confirm that portion A of the threading ring is pushing the roller and drawer guide of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 1)

If specification 1 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 in Section 3-25-1.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 2)

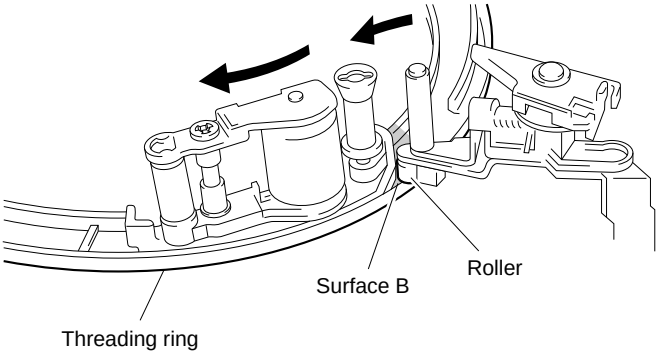
If specification 2 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 in Section 3-25-1.)

・Threading



Spec. 1 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Unthreading

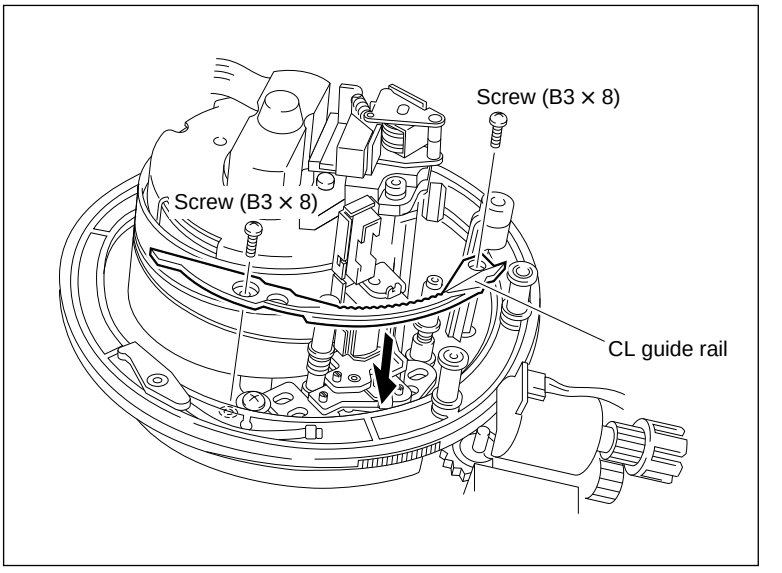


Spec. 2 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confirm the T Drawer Assembly Operation

25. Install the CL Guide Rail

Install the CL guide rail with two screws.

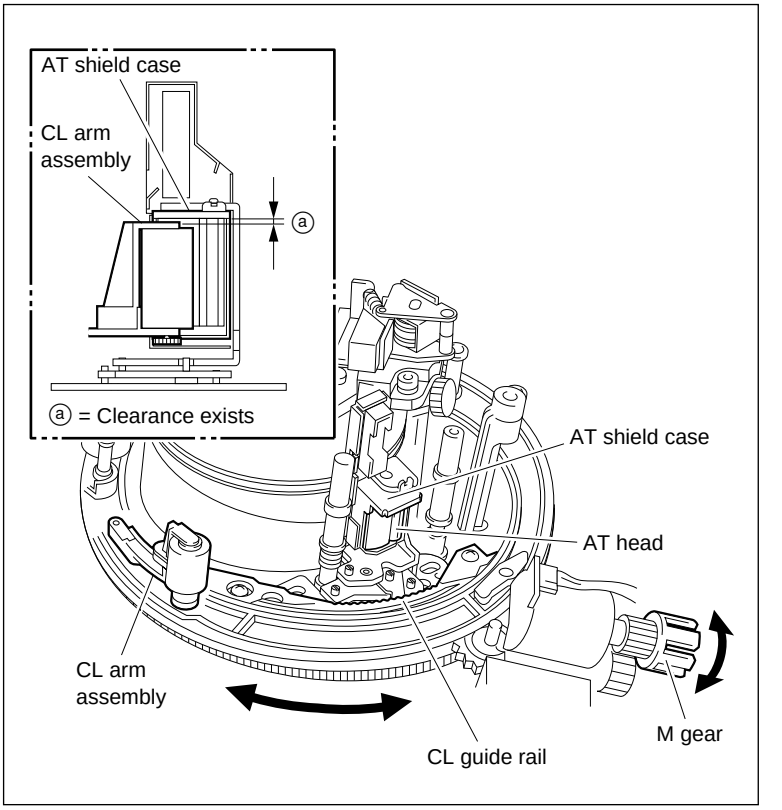


Install the CL Guide Rail

26. Confirm the CL Arm Assembly Operation

Turn the M gear of the gear box assembly and confirm the following items while repeating the threading and unthreading.

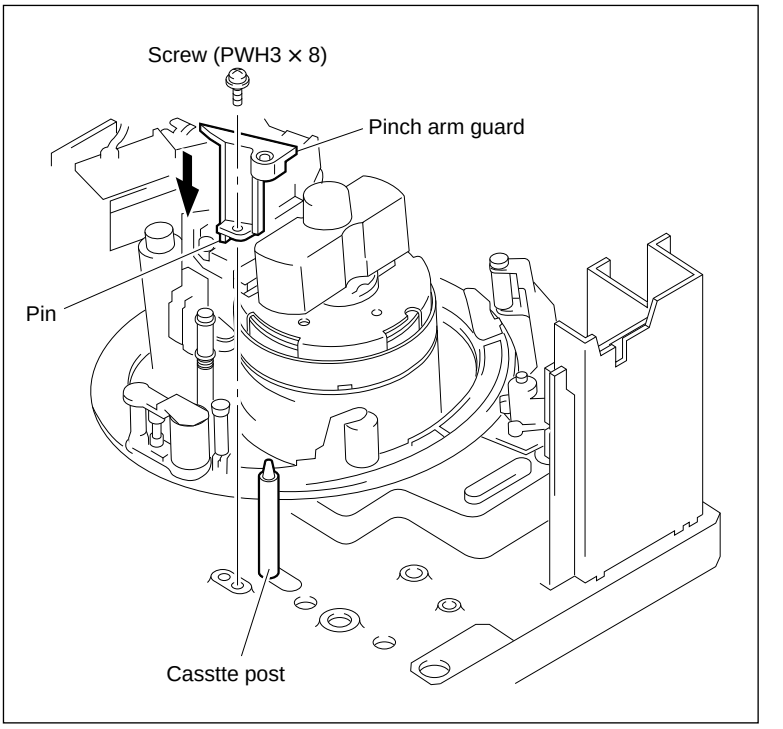
- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the top of the CL arm assembly and the AT shield case when the cleaning roller cleans the AT head.



Confiirm the CL Arm Assembly Operation

27. Install the Pinch Arm Guard

(1) Pass the pinch arm guard through the cassette post and put the pin into the chassis hole.
(2) Tighten the screw.



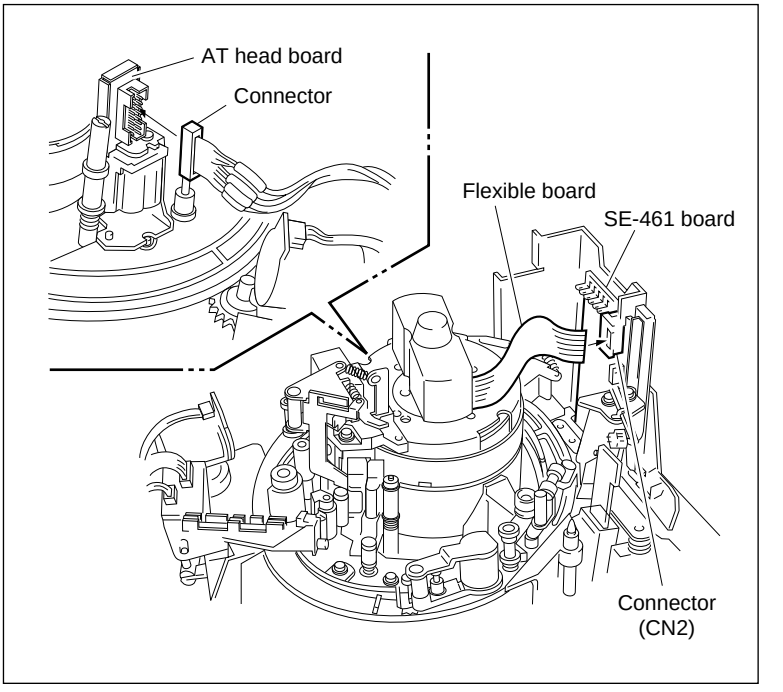
Install the Pinch Arm Guard

28. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-341 board, then lock.

29. Connect the Harness

Connect the harness to the connector of the AT head board.

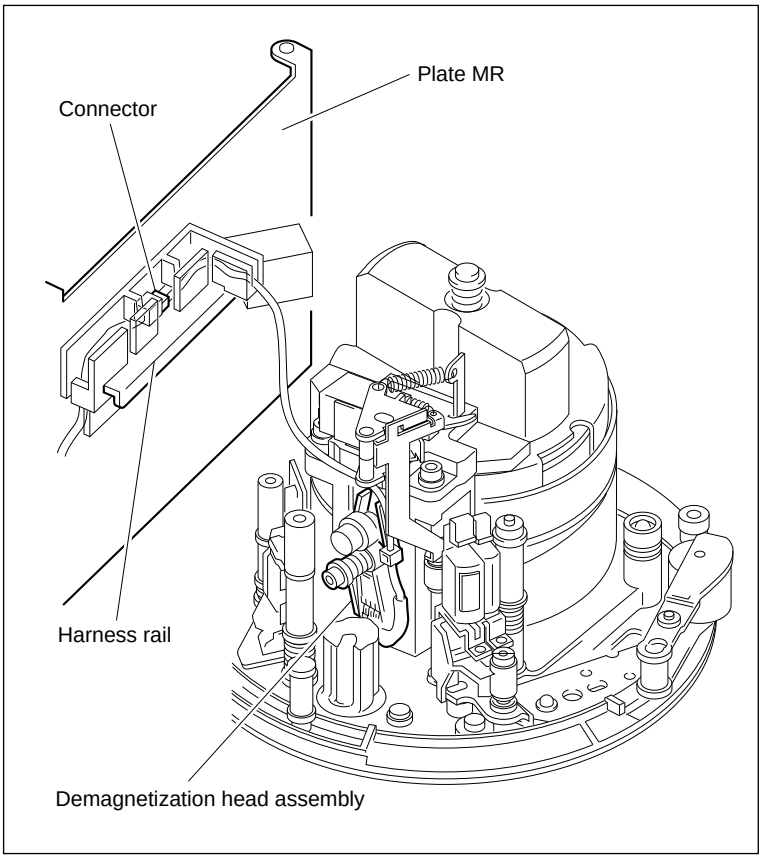


Connect the Flexible Board/Harness

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30. Connect the Harness

Connect the connector of demagnetization head assembly on the harness rail.



Connect the Harness

Adjustment after Replacement

31. Pinch Pressure Clearance Adjustment

Refer to Section 3-11-2.

32. Confirm the Tape Running

Refer to Section 4-1-2.

3-23. S Tention Regulator Assembry Replacement

Outline

Replacement

1. Put the Unit into the Unthreading End State
2. Remove the S Tension Regulator Assembly
3. Install the S Tension Regulator Assembly

Adjustment after Replacement

4. Tape Running Adjustment (Refer to Section 4-1-2.)
5. Tension Offset Adjustment
   (Refer to Section 4-2 of the maintenance manual part 1.)
   (A008: S/T TENSION OFFSET)

Note

The replacement of the component part on the S tension regulator assembly requires a precise adjustment. Therefore, replace the whole assembly (A-8267-795-E).

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Put the Unit into the Unthreading End State

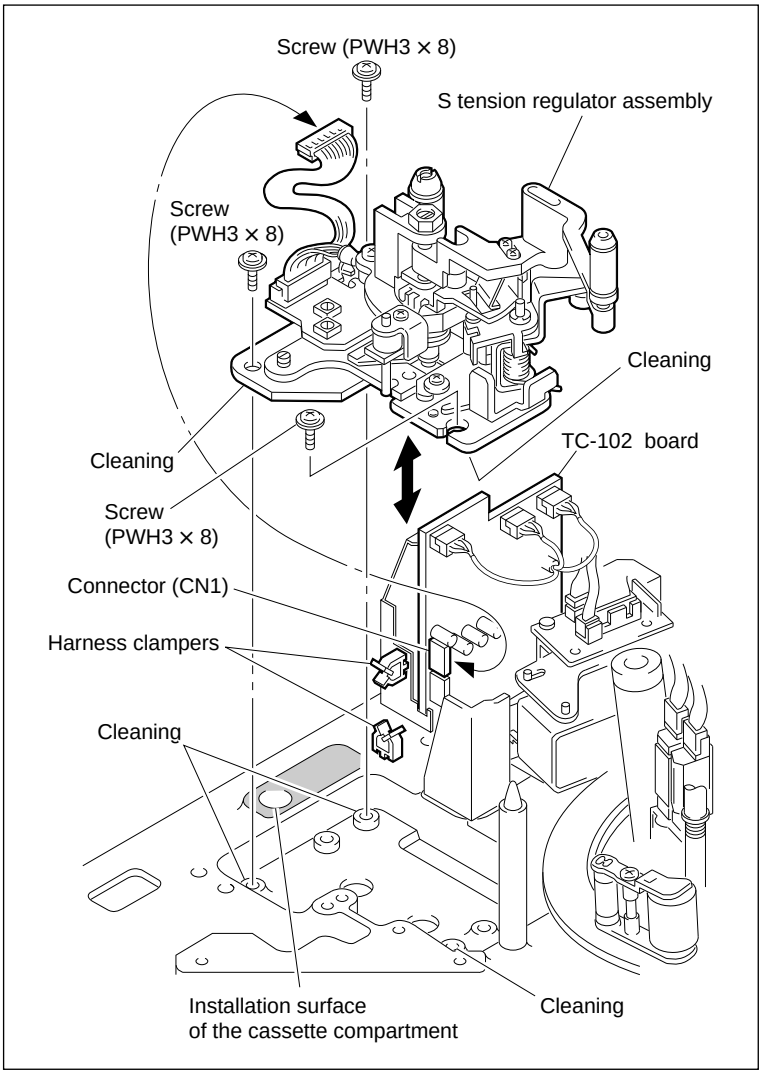
2. Remove the S Tension Regulator Assembly

(1) Disconnect the harness from the connector CN1 on the TC-102 board.
(2) Remove the three screws, then remove the S tension regulator assembly.

Installation

3. Install the S Tension Regulator Assembly

(1) Clean the installation surface of the S tension regulator assembly and chassis in three portions.
(2) Set the S tension regulator assembly and tighten the three screws.
(3) Connect the connector to CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the installation surface (portion in the figure) of the cassette compartment.



Remove/Install the S Tension Regulator Assembly

Adjustment after Replacement

4. Tape Running Adjustment

Refer to Section 4-1-2.

5. Tension Offset Adjustment

Refer to Section 4-2 of the maintenance manual part 1.
(A008: S/T TENSION OFFSET)

3-24. T Tention Arm Replacement

Outline

Replacement

1. Remove the Tension Spring (on the T Tension Base Side)
2. Remove the T Tension Arm
3. Remove the Yoke Plate
4. Install the Yoke Plate
5. Install the T Tension Arm
6. Install the Tension Spring (on the T Tension Base Side)
7. Confirm the T Tension Regulator Operation

Adjustment after Replacement

8. Tension Offset Adjustment
   (Refer to Section 4-2 of the maintenance manual part 1.)
   (A008: S/T TENSION OFFSET)

Notes

- This section explains the replacement procedures of the T tension arm.
  When replacing whole of the T tension assembly, refer to exploded views of the maintenance manual part 2 volume 2.
  The T tension assembly supplied as repair parts differs in the harness length from one used in this unit because of standardization of repair parts. When replacing the T tension assembly, replace the harness by one used in this unit.
- Use a new stop washer when the T tension arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

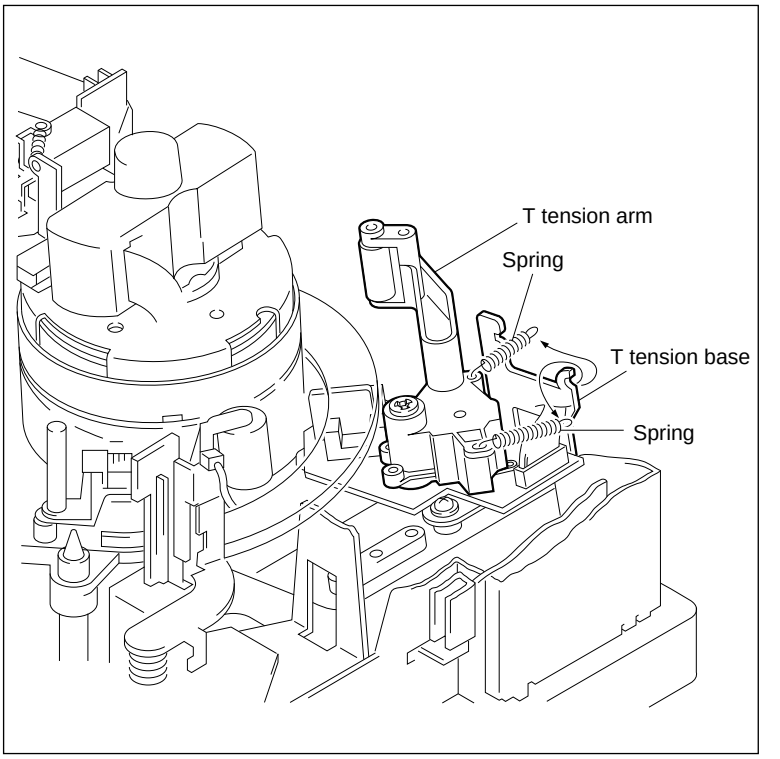
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the Tension Spring

Remove the two springs caught on the T tension base.



Remove the Tension Spring

2. Remove the T Tension Arm

(1) Remove the stop washer, then remove the T tension arm.

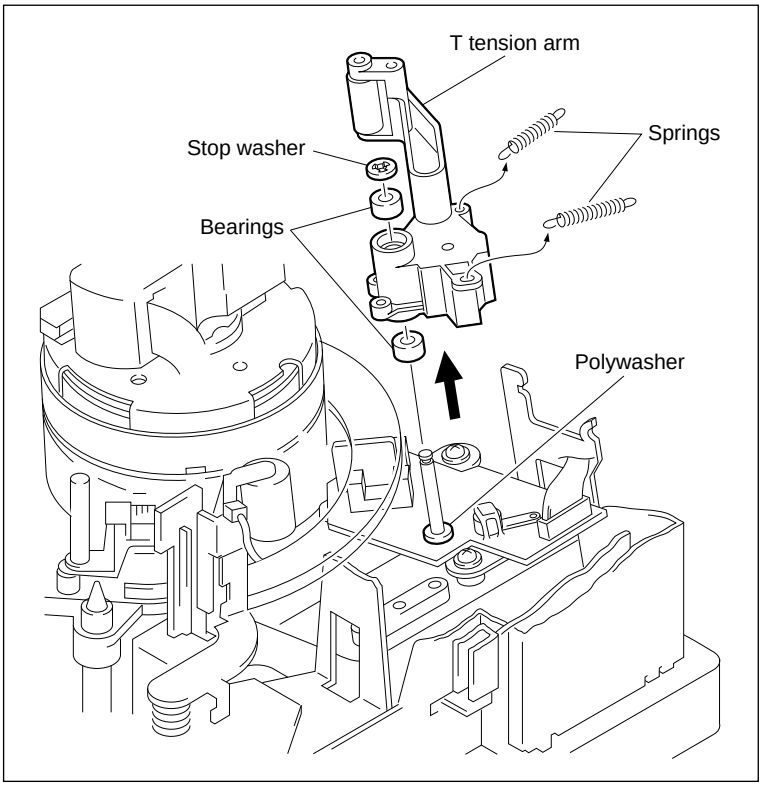
Notes

- Do not reuse the stop washer.
- A polywasher may be attached together when the T tension arm is removed. In this case, remove the polywasher from the T tension arm and return it to the shaft.

(2) Remove the two bearings and two springs from the T tension arm.

Note

The two springs are the same.



Remove the T Tension Arm

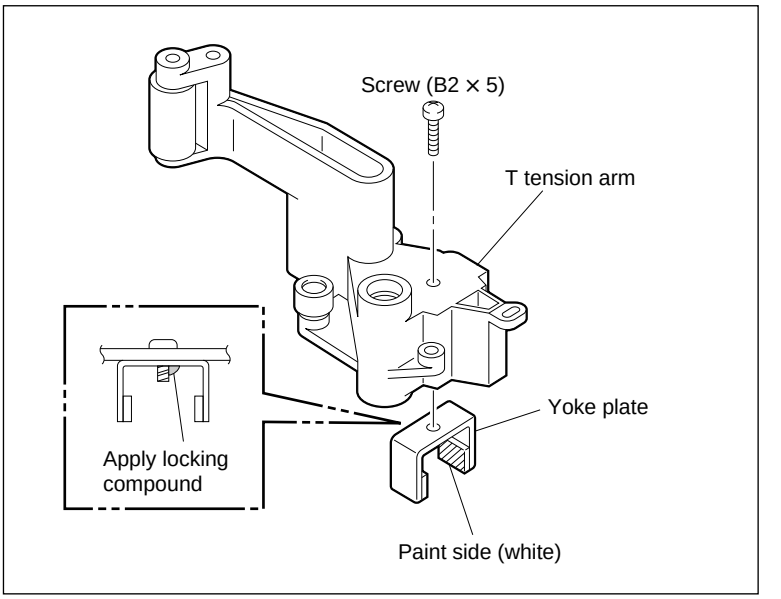
3. Remove the Yoke Plate

Remove the screw, then remove the yoke plate from the T tension arm.

Installation

4. Install the Yoke Plate

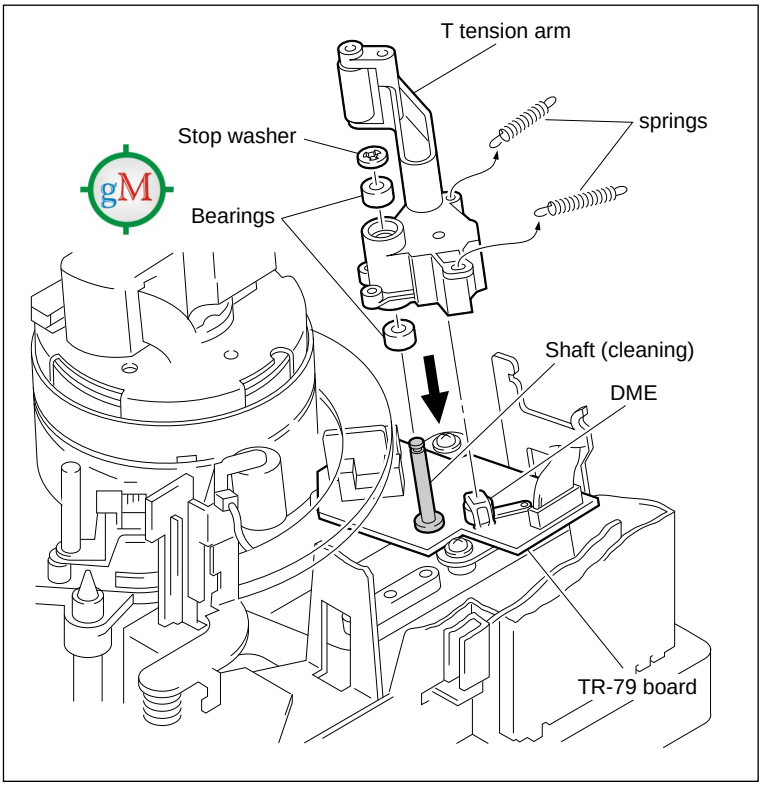
(1) Put the yoke plate in the direction shown in the figure and tighten the screw.
(2) Apply locking compound slightly to the yoke plate.



Remove/Install the Yoke Plate

5. Install the T Tension Arm

(1) Clean the shaft.
(2) Insert the bearing into the T tension arm.
(3) Put the two springs on the T tension arm as shown in the figure.
(4) Pass the T tension arm through the shaft while putting DME on the TR-79 board in the T tension arm.
(5) Fix the T tension arm using a new stop washer.



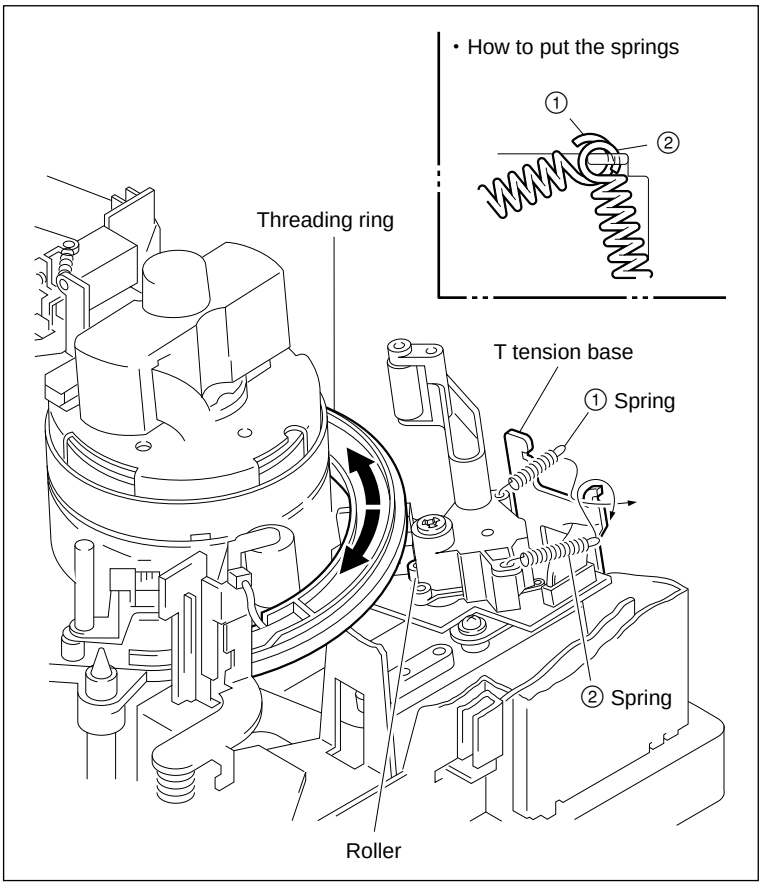
Install the T Tension Arm

6. Install the Tension Spring

Put the two springs removed in (2) of step 2 on the T tension base in the order of ① and ② in the direction shown in the figure.

7. Confirm the T Tension Regulator Operation

Put the threading ring into the threading/ unthreading state and confirm that the T tension regulator roller is not dislocated from the threading ring and operates normally.



Install the Tension Spring

Adjustment after Replacement

8. Tension Offset Adjustment

(Refer to Section 4-2 of the maintenance manual part 1.)
(A008: S/T TENSION OFFSET)

3-25. T Drawer Arm Replacement

3-25-1. T Drawer Arm Replacement

Outline

Replacement

1. Remove the T Drawer Assembly
2. Remove the T Drawer Arm
3. Remove the Slant Guide
4. Remove the Slant Guide Base
5. Remove the Drawer Guide
6. Install the Drawer Guide
7. Install the Slant Guide Base
8. Install the Slant Guide
9. Install the T Drawer Arm
10. Install the T Drawer Assembly
11. Confirm the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment (Refer to Section 3-25-2.)

Notes

- The slant guide, slant guide base, and drawer guard can be replaced in the same procedure as described in this section.
- Use a new stop washer when the T drawer arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

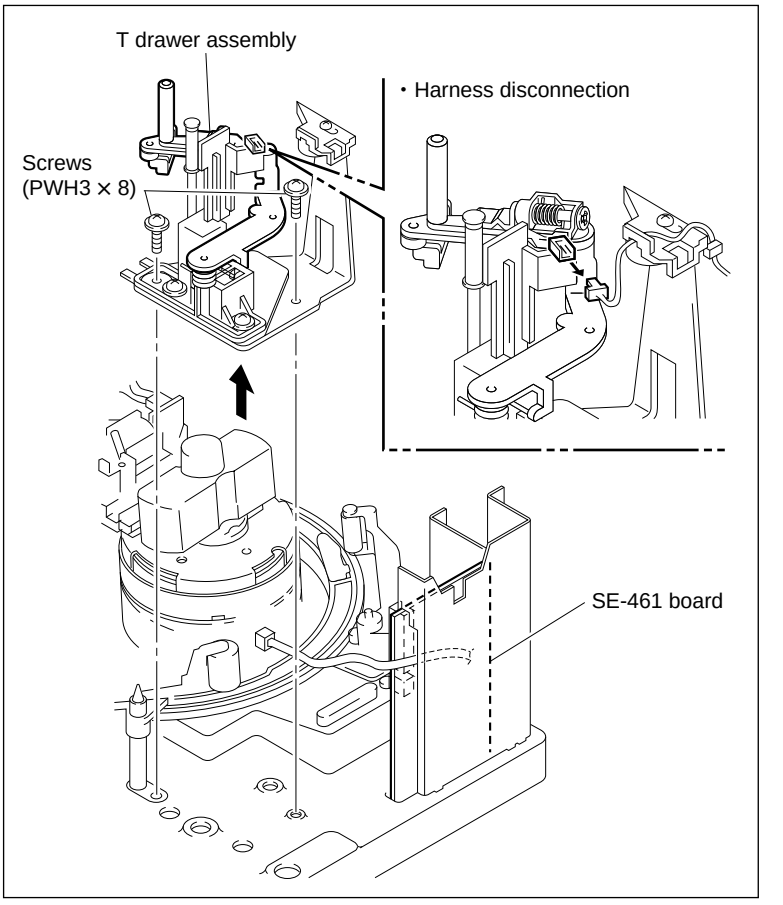
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01
- Calipers (or the equivalent)

Removal

1. Remove the T Drawer Assembly

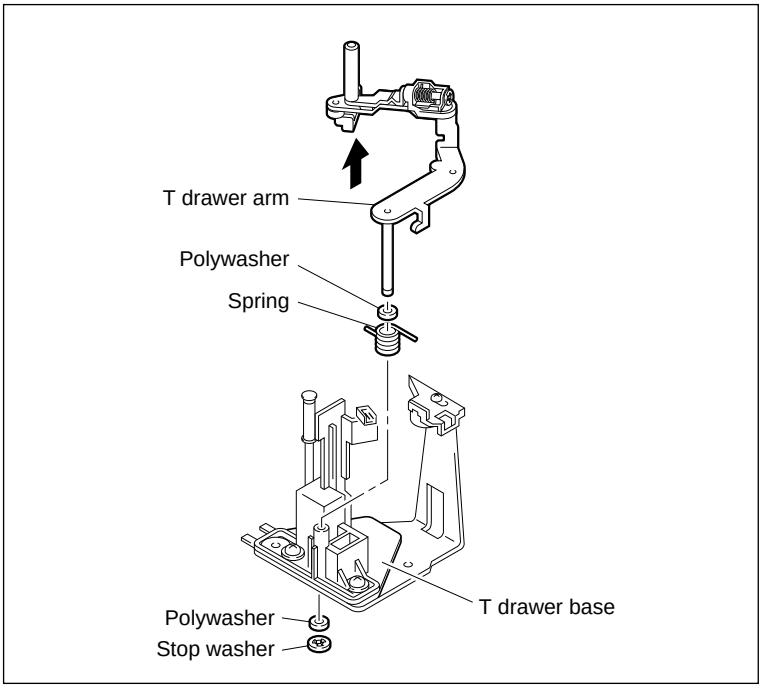
(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

2. Remove the T Drawer Arm

(1) Remove the stop washer and polywasher, then remove the T drawer arm from the T drawer base.
(2) Remove the spring and polywasher.



Remove the T Drawer Arm

3. Remove the Slant Guide
Remove the stop washer, then remove the slant guide and spring from the T drawer arm.

4. Remove the Slant Guide Base
Remove the screw, then remove the slant guide base from the T drawer arm.

5. Remove the Drawer Guard
Remove the screw, then remove the drawer guard from the T drawer arm.

Installation

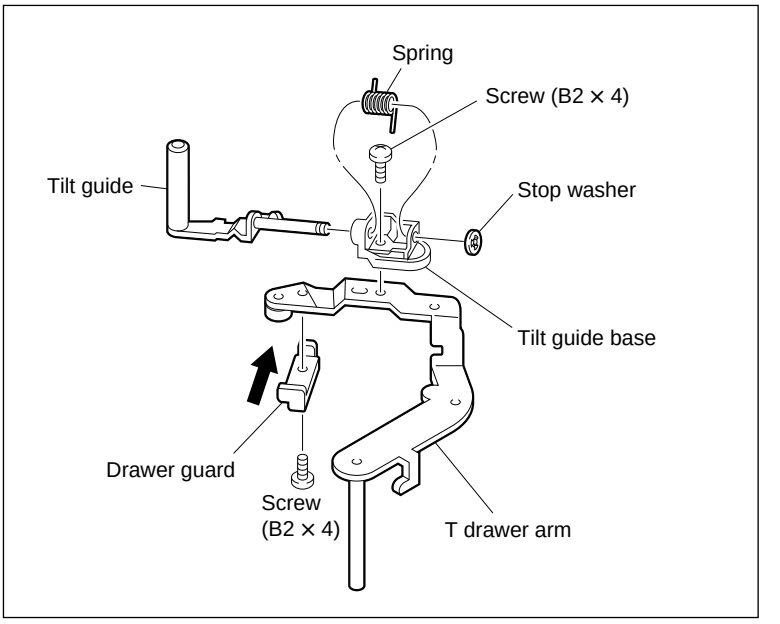
6. Install the Drawer Guard
(1) Push the drawer guard in the direction indicated by the arrow and tighten the screw.
(2) Apply locking compound to the screw.

7. Install the Slant Guide Base
(1) Move the slant guide base counterclockwise and tighten the screw.
(2) Apply locking compound to the screw.

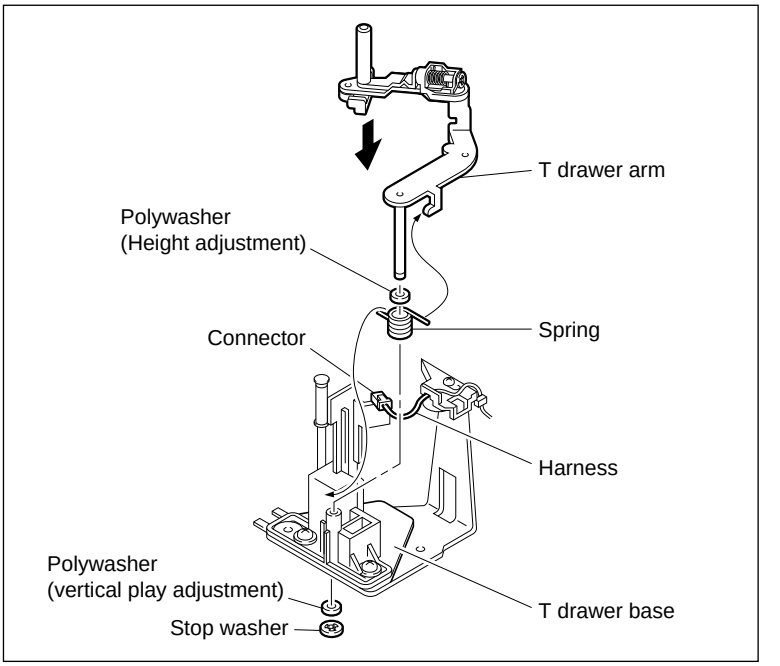
8. Install the Slant Guide
(1) Pass the spring through the Slant guide base while passing it through the slant guide shaft.
(2) Put the spring on the slant guide base.
(3) Fix the slant guide using a new stop washer.

9. Install the T Drawer Arm
(1) Pass the polywasher and spring through the T drawer base while passing them through the shaft of the T drawer arm assembly.
(2) Put the spring on the T drawer arm and T drawer base.
(3) Confirm that specification 1 is satisfied with the T drawer arm pushed downward.

If specification 1 is not satisfied, perform the following adjustment. (Height adjustment)
① Remove the T drawer arm and spring.
② Adjust the polywasher value at the top of the T drawer base.
③ Confirm that specification 1 is satisfied.



T Drawer Arm Disassemble/Assemble



Install the T Drawer Arm

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(4) Pass the polywasher through the shaft and fix the T drawer arm using a new stop washer.
(5) Move the T drawer arm manually in the vertical direction. At that time, confirm that the vertical play satisfies specification 2.

If specification 2 is not satisfied, perform the following adjustment. (Vertical play adjustment)

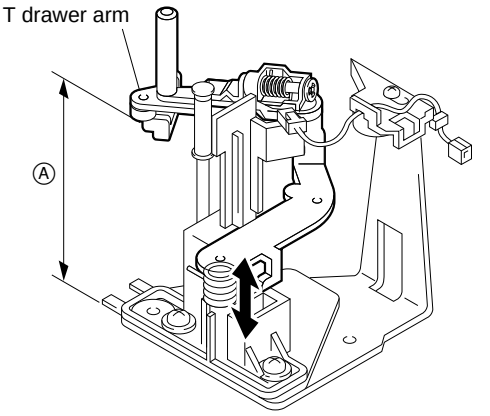
① Remove the stop washer.
② Adjust the polywasher value at the bottom of the T drawer base.
③ Fix the T drawer arm using a new stop washer and confirm that specification 2 is satisfied.

(6) Confirm that the height of the T drawer arm satisfies the specification 3 with the T drawer arm turned to clockwise by finger.
If specification 3 is not satisfied, perform the procedures (3) and later again.

Note

Some of the T drawer assemblies have no arm stopper. In these cases, the confirmation described above, step 6, is not required.

• T drawer arm height adjustment/vertical play adjustment



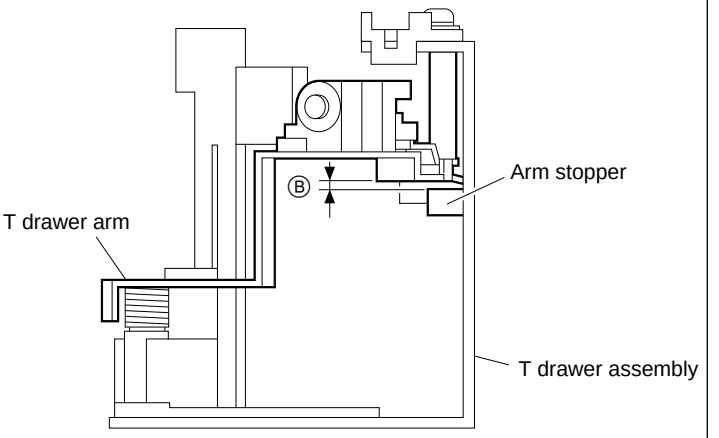
Spec. 1 : (height)
Ⓐ = 36.3 mm to 36.7 mm
Spec. 2 : (vertical play)
0.2 mm or less

• Spec. 1 and 2 are not satisfied.

• Polywasher to adjustment

diameter	thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11
	0.5 mm	3-701-439-21

< Side view >

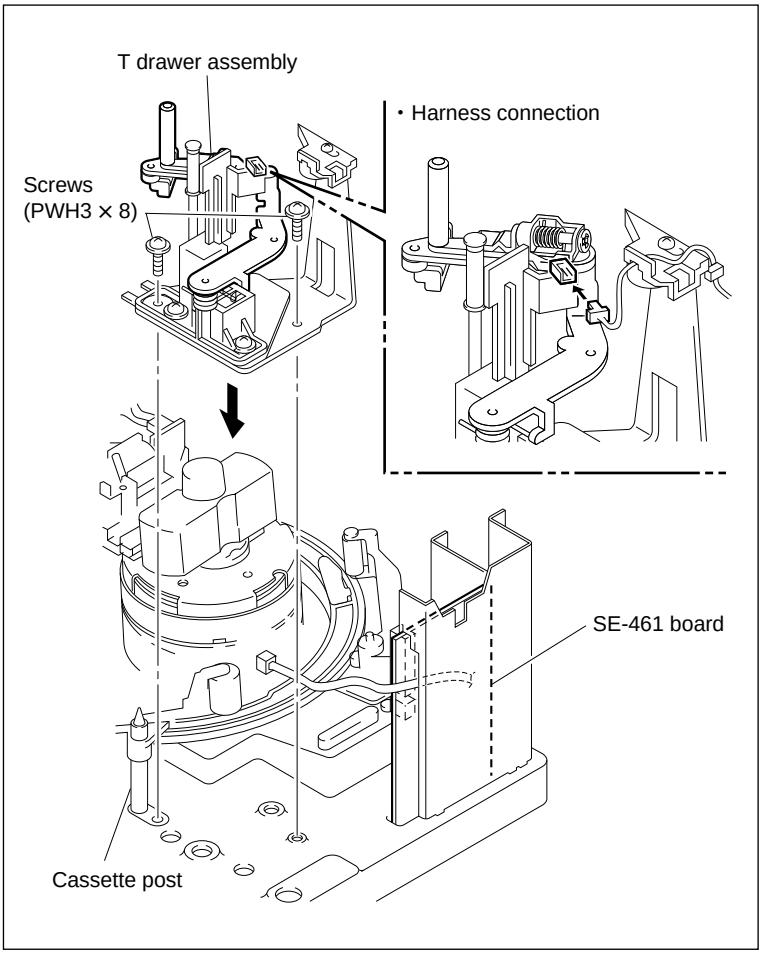


Spec. 3 : Ⓑ ≧ 0.2 mm
(Between arm stopper and arm)

Install the T Drawer Arm

10. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Install the T Drawer Assembly

11. Confirm the T Drawer Assembly Operation

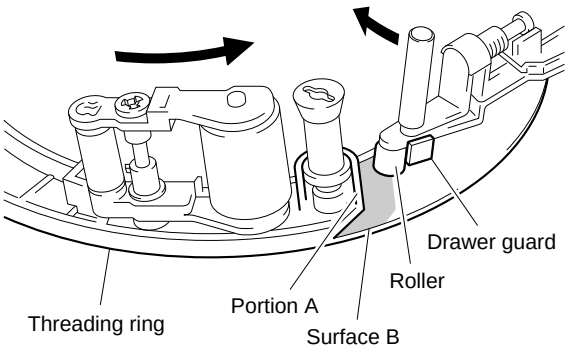
(1) Confirm that portion A of the threading ring is pushing the roller and drawer guard of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 4)

If specification 4 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 5)

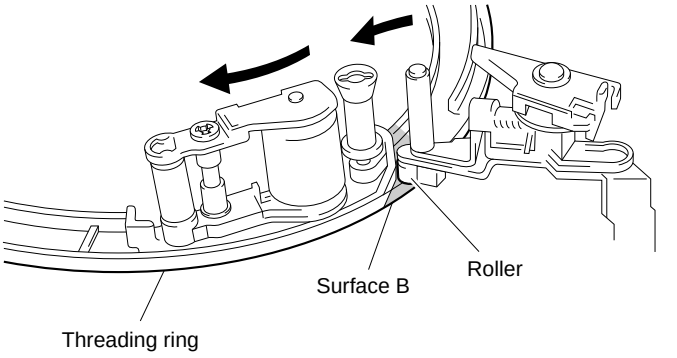
If specification 5 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)

・Threading



Spec. 4 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Untherading



Spec. 5 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confim the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment

Refer to Section 3-25-2.

3-25-2. Slant Guide Slantness Adjustment

Note

Be sure to perform this adjustment when the T drawer arm and slant guide are replaced.

Tools

- Cassette reference plate (L)(MW-088): J-6320-880-A
- Tension regulator verticality check tool (BW-080): J-6190-800-A
- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Locking compound: 7-432-114-11
- Metal cassette tape for Betacam SP (L cassette)

Confirmation

1. Install the Cassette Reference Plate (L)

Put the cassette reference plate (L) in the direction shown in the figure and align it with the two cassette posts.

2. Confirm the Slant Guide Slantness

(1) Press the check tool against the slant guide from the directions indicated by arrows A and B.

(2) Confirm that the clearance between the slant guide and tool satisfies specifications 1 and 2.

If specifications 1 and 2 are not satisfied, repeat procedures ① and ② below until they are satisfied.

① Bend the slant guide so that specifications 1 and 2 are satisfied.

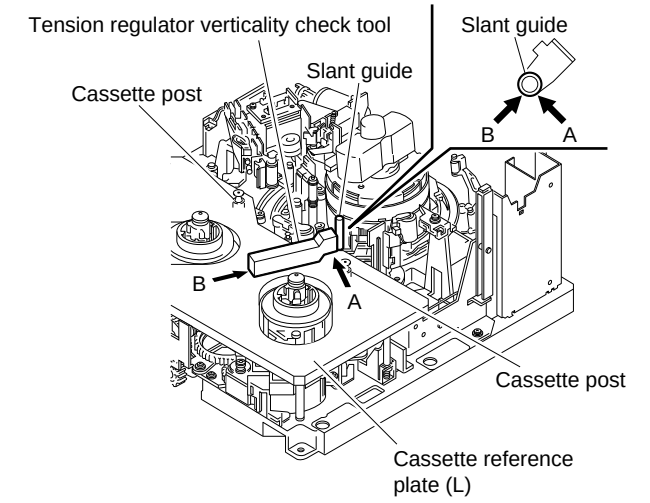
② Repeat the threading/unthreading and reconfirm that specifications 1 and 2 are satisfied.

3. Remove the Cassette Reference Plate

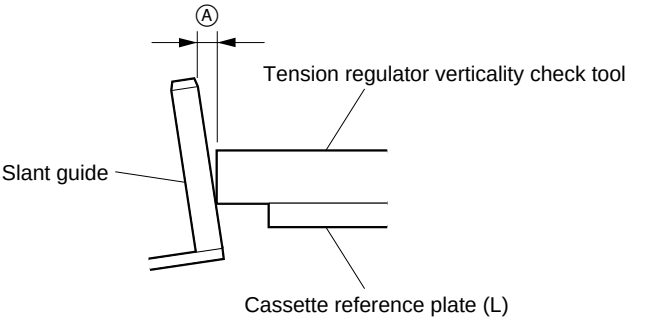
Remove the tension regulator verticality check tool and cassette reference plate (L).

4. Cleaning

Clean the slant guide with cleaning cloth moistened with cleaning fluid.

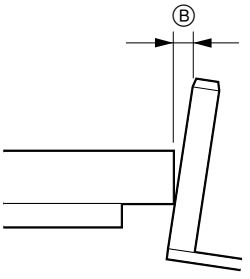


< Direction of A >



Spec. 1 :
0.15 mm ≦ Ⓐ ≦ 0.25 mm

< Direction of B >



Spec. 2 :
0.15 mm ≦ Ⓑ ≦ 0.25 mm

Confirm the Slant Guide Slantness

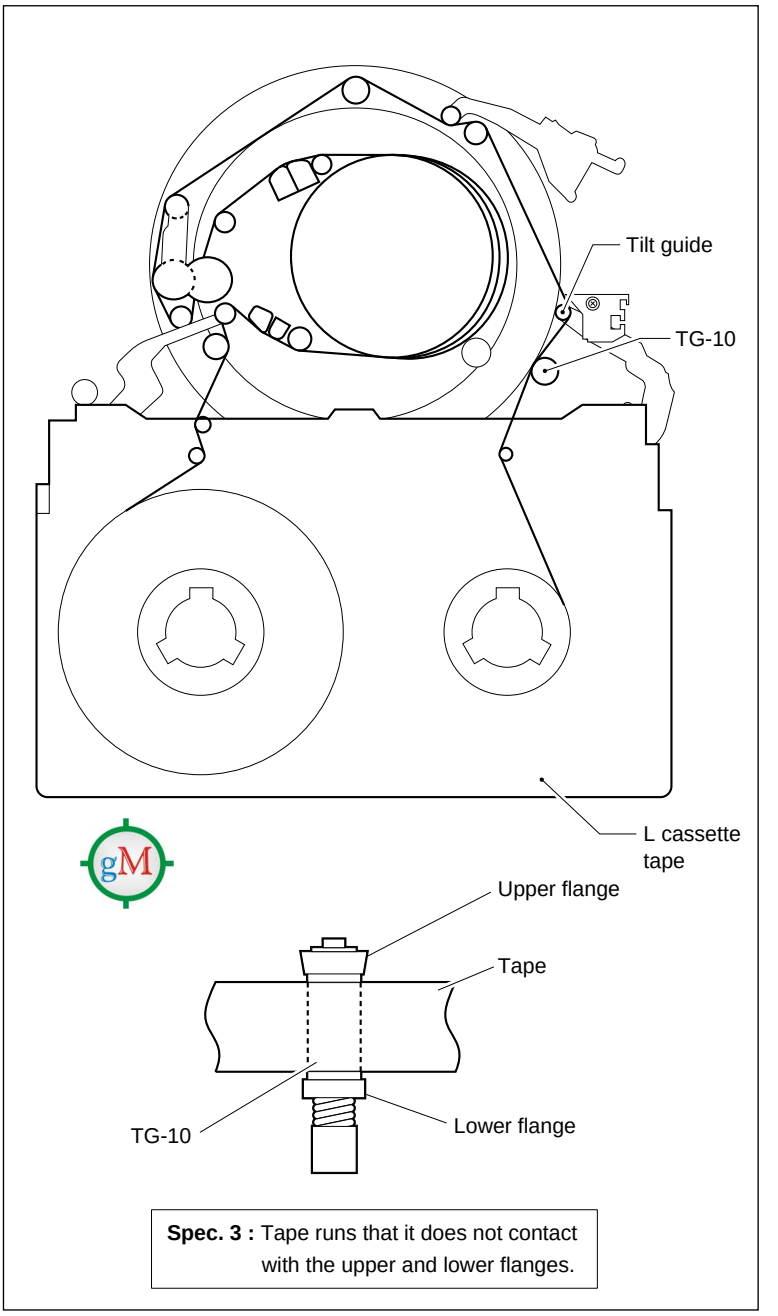
5. Set the L Cassette Tape

(1) Put the RS table block assembly into the L cassette position.
(2) Set the L cassette tape and put a weight so that the cassette is stable.
Weight about 1,000 g is suitable.

6. Tape Running Confirmation at TG-10 Guide

(1) Put the unit into the F.FWD mode, then put it into the PLAY mode after approximately three seconds.
(2) Confirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, perform the adjustments in procedures 7 and later.



Tape Running Confirmation at TG-10 Guide

Adjustment

7. Loosen the Screw

Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.

8. Slant Guide Slantness Adjustment

(1) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the adjustment plate so that specification 3 is satisfied.

- When the tape touches with the upper flange: Move the adjustment plate in the direction indicated by arrow A.
- When the tape touches with the lower flange: Move the adjustment plate in the direction indicated by arrow B.

9. Tighten the Screw

Tighten the screw loosened in procedure 7.

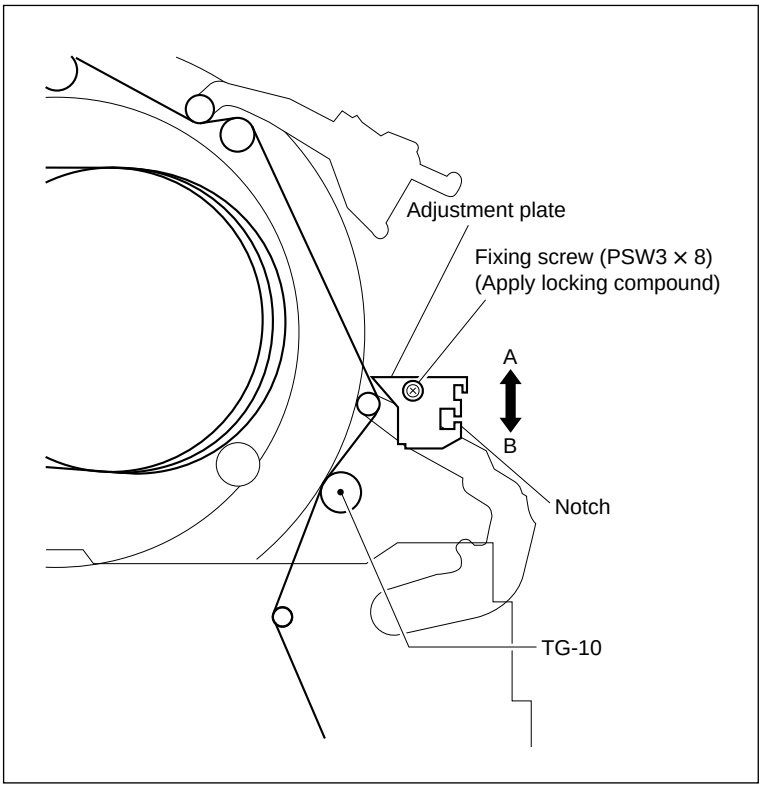
10. Tape Running Reconfirmation at TG-10 Guide

(1) Put the unit into the unthreading end mode.
(2) Put the unit into the PLAY mode again, and reconfirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, repeat procedures 7 through 10.

11. Apply Locking Compound

Apply the locking compound to the securing screw of the adjustment plate.



Slant Guide Slantness Adjustment

3-26. Cassette Compartment Motor Replacement

Outline

Replacement

1. Disconnect the Harness (CN935/CL-29 Board)
2. Remove the Warm
3. Remove the Cassette Compartment Motor
4. Remove the Motor Joint
5. Remove the Spacer and Disconnect the Harness
6. Harness Soldering
7. Install the Motor Joint
8. Install the Spacer and Warm
9. Install the Cassette Compartment Motor
10. Grease Smearing
11. Connect the Harness (CN935/CL-29 Board)

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.)
    (C013: CASSETTE COMP.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Grease (SGL-601): 7-651-000-10
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Calipers (or the equivalent)

Removal

1. Disconnect the Harness

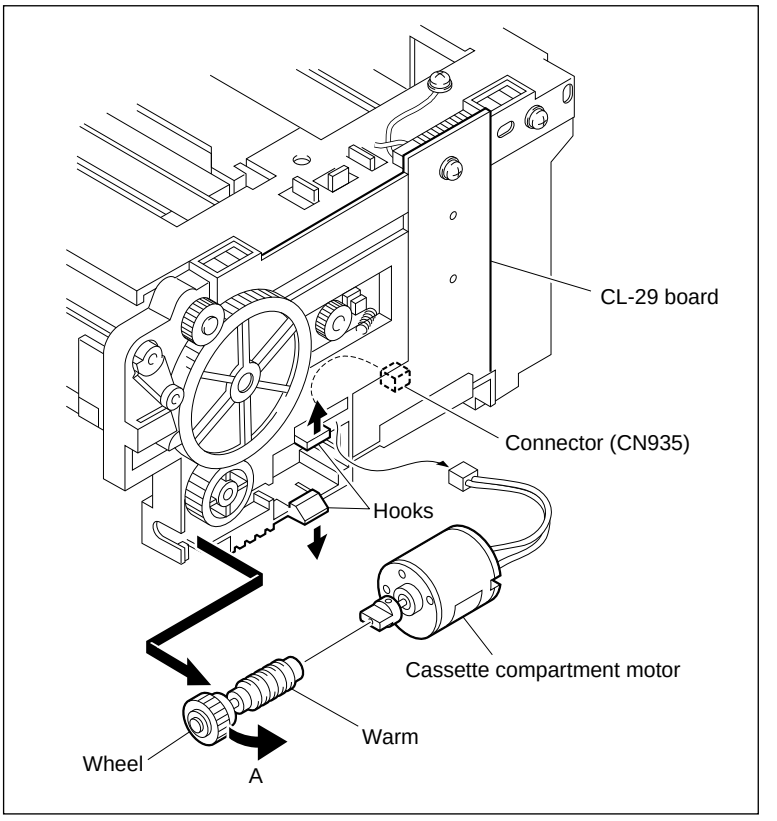
Disconnect the harness from the connector CN935 on the CL-29 board.

2. Remove the Warm

Push the wheel in the direction indicated by arrow A and take out the warm.

3. Remove the Cassette Compartment Motor

Spread the hooks of the chassis and push out the cassette compartment motor from the inside of the cassette compartment.



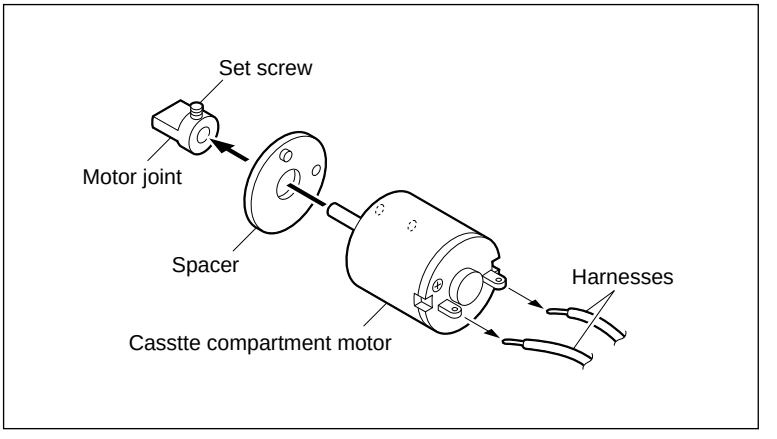
Remove the Cassette Compartment Motor (1)

4. Remove the Motor Joint

Loosen the set screw by two to three turns and remove the motor joint.

5. Remove the Spacer and Disconnect the Harness

(1) Remove the spacer.
(2) Unsolder and disconnect the harness from the motor.



Remove the Cassette Compartment Motor (2)

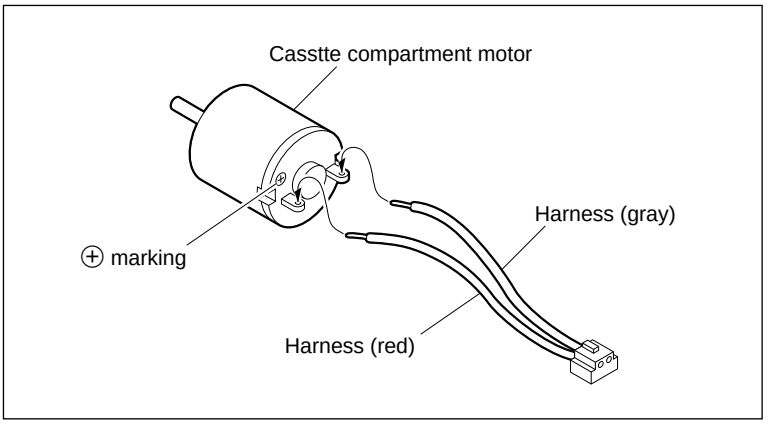
Installation

6. Harness Soldering

Solder the harness disconnected in (2) of procedure 5 to a new motor.

Note

Solder a red harness to marking "+" of the motor.



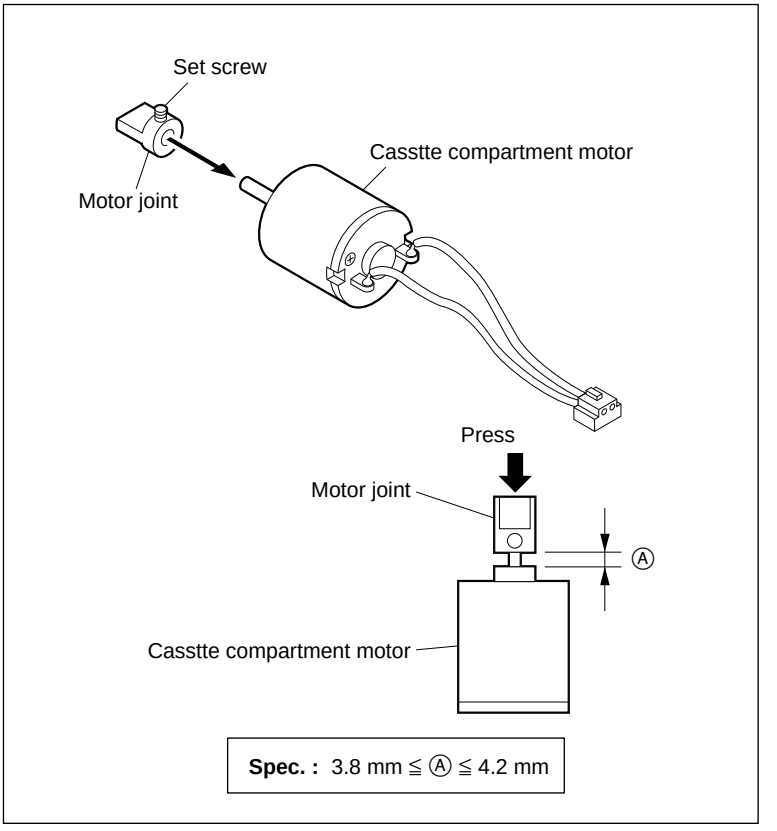
Harness Soldering

7. Install the Motor Joint

(1) Pass the motor joint through the shaft of the motor and fix the set screw temporarily.

(2) Confirm that the clearance between the motor joint and motor satisfies the specification when the motor joint is pushed toward the motor and tighten the setscrew.

Tightening torque: 60×10^{-2} N • m
(6 kgf • cm)

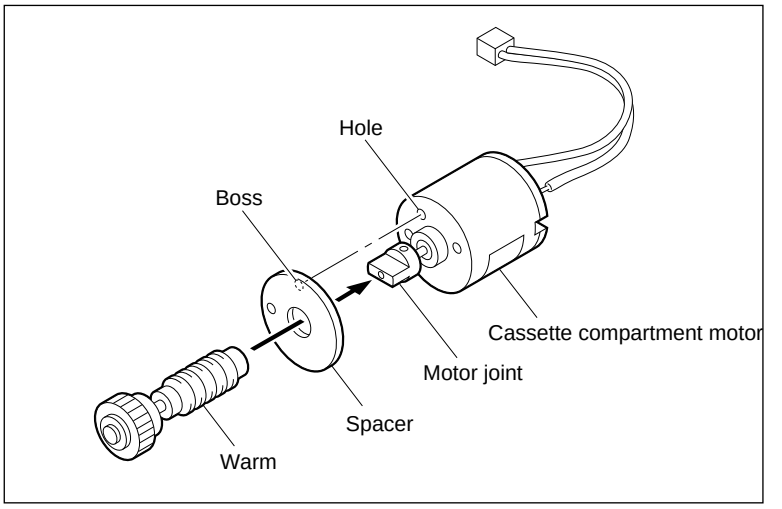


Install the Motor Joint

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8. Install the Spacer and Warm

(1) Put the boss of the spacer in the hole of the motor.
(2) Align the warm with the motor joint, then insert it.



Install the Spacer and Warm

9. Install the Cassette Compartment Motor

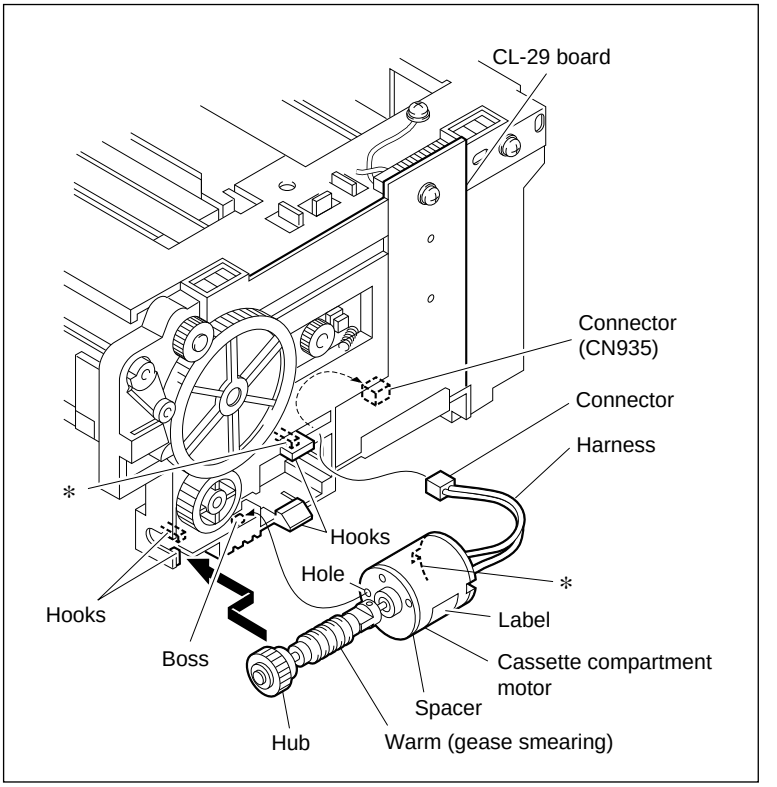
(1) Put the motor in the direction shown in the figure and pass the harness through the hole of the chassis.
(2) Place the ∗-marked portion of the motor shown in the figure and put the motor in the two hooks while inserting the hole of the spacer into the boss of the chassis. Simultaneously, put the hub of the warm in the two hooks of the chassis.
(3) Confirm that the motor has been fixed.

10. Grease Smearing

(1) Wipe the grease on the warm and clean it.
(2) Smear grease slightly to the warm.

11. Connect the Harness

Connect the connector of the cassette comportment motor's harness to connector CN935 on the CL-29 board.



Install the Cassette Compartment Motor

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation

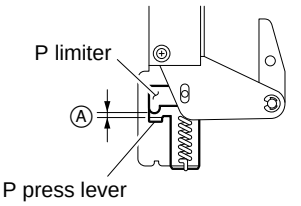
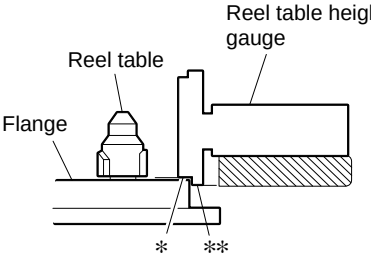
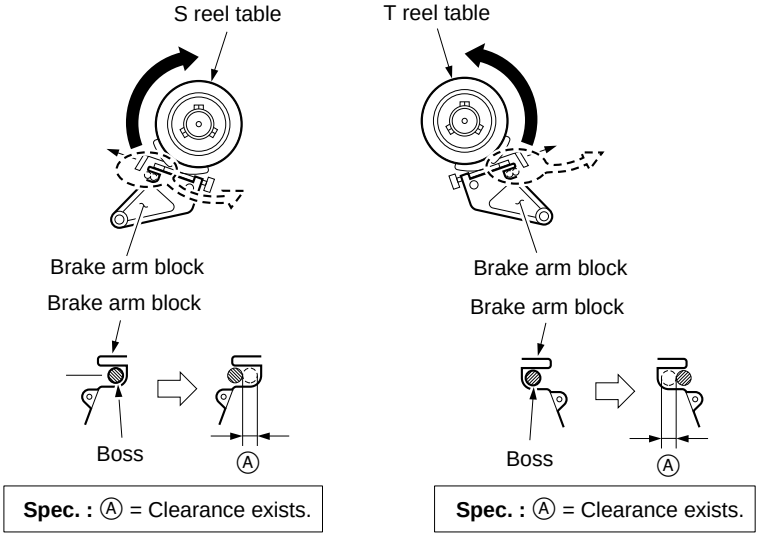
Refer to Section 4-2 of the maintenance manual part 1.
(C013: CASSETTE COMP.)

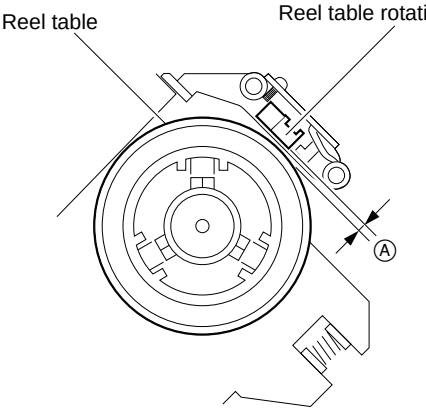
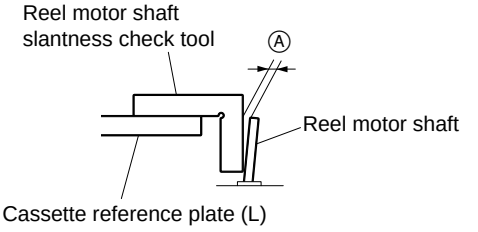
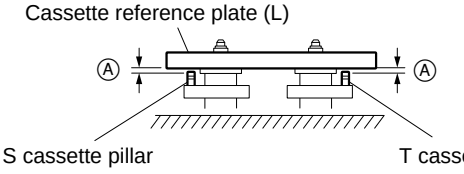
Note

Perform this check with the cassette compartment installed in the unit.

3-27. Mechanical Adjustment Table

Index

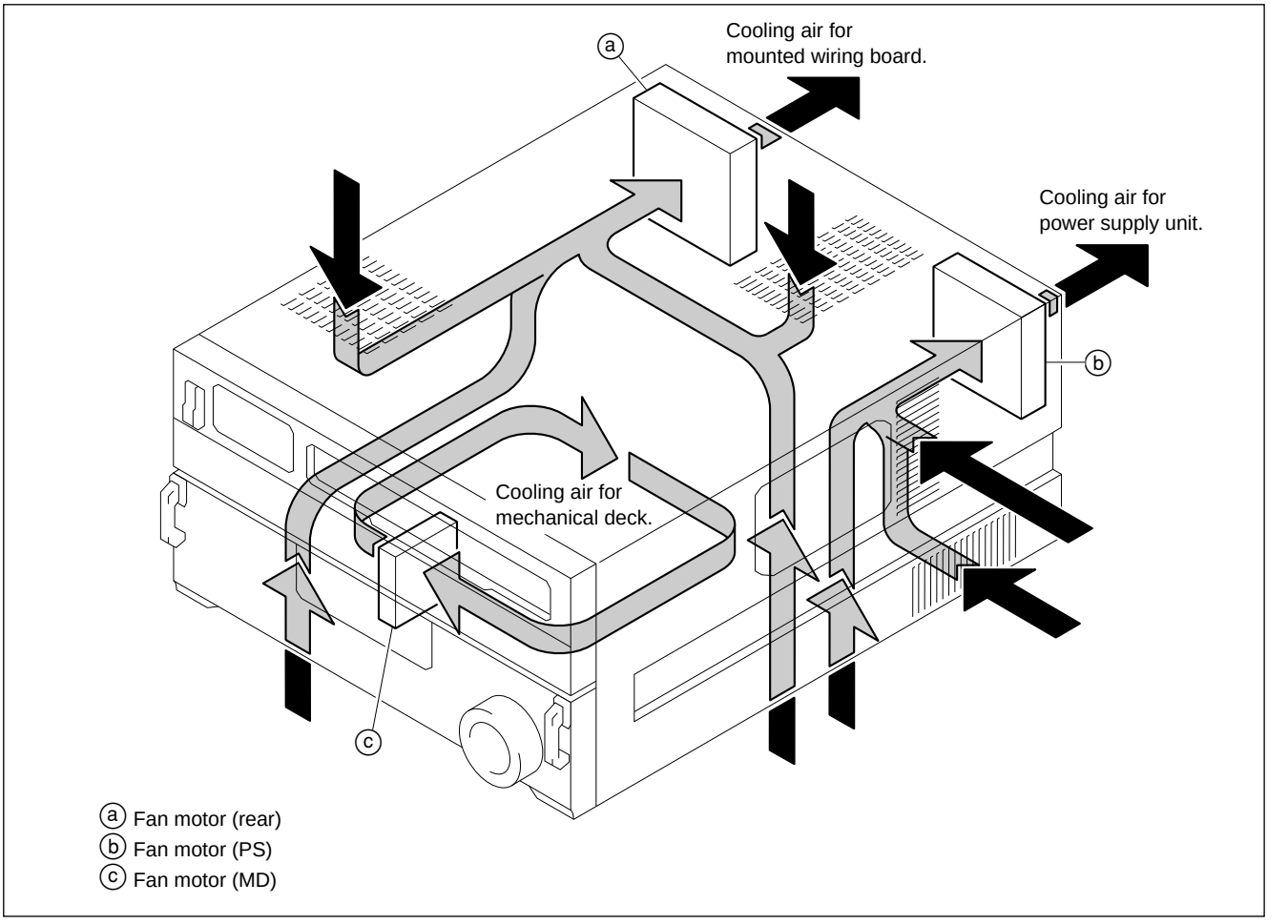
Adjustment	Specification	Page
Pinch Press Clearance Adjustment	 **Spec. :** Ⓐ = 0.6 to 0.8 mm	3-61
Reel Table Height Adjustment	 **Spec. :** The ∗ marked portion of the gauge slide over the frange of the reel table. The ∗∗ marked portion of the gauge does not slide over.	3-75
Reel Brake Clearance Check	 **Spec. :** Ⓐ = Clearance exists. **Spec. :** Ⓐ = Clearance exists.	3-78
Reel Brake Release Amount Adjustment	**Spec. :** The brake lining does not touch a reel table while reel table rotatong.	3-79

Adjustment	Specification	Page
Reel Rotation Sensor Position Adjustment	 **Spec. :** Ⓐ = 0.1 mm or more	3-81
Reel Motor Shaft Slantness Adjustment	 **Spec. 1 :** (L cassette position) Ⓐ ≦ 0.03 mm **Spec. 2 :** (S cassette position) Ⓐ ≦ 0.1 mm	3-96
Cassette Pillar Height Adjustment	 **Spec. :** Ⓐ = No clearance exists.	3-99

3-28. Fan Motor Replacement

This unit has three fan motors. Replace each fan motors every 40,000 hours of energizing.

1. Index



2. Note

- Replace the fan motors when displaying a alarm informing for fan motor in addition to the periodic replacement.
- When the fan motor stops because of trouble, some components inside the unit may be heated to high temperatures.
  Take care not to burn your hands by touching these components.
  In service operation, turn off the power and perform the service operation after the temperatures turns to ordinary state.

3-28-1. Fan Motor (Rear) Replacement

Outline

Replacement

1. Remove the Connector Panel
2. Remove the Fan Motor (Rear)
3. Install the Fan Motor (Rear)
4. Install the Connector Panel

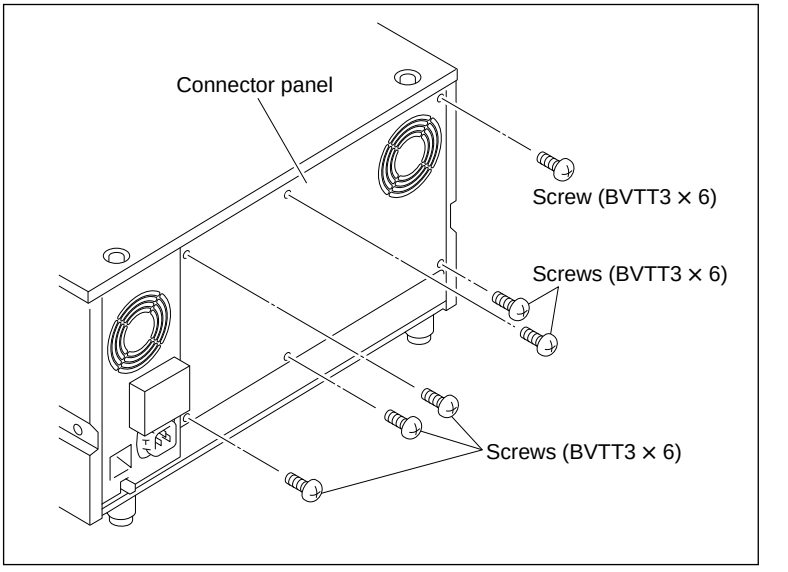
Removal

1. Remove the Connector Panel

Loosen the six screws and remove the connector panel.

Note

It is not neccessary to disconnect the harness connected to the connector panel.



Remove the Connector Panel

2. Remove the Fan Motor (Rear)

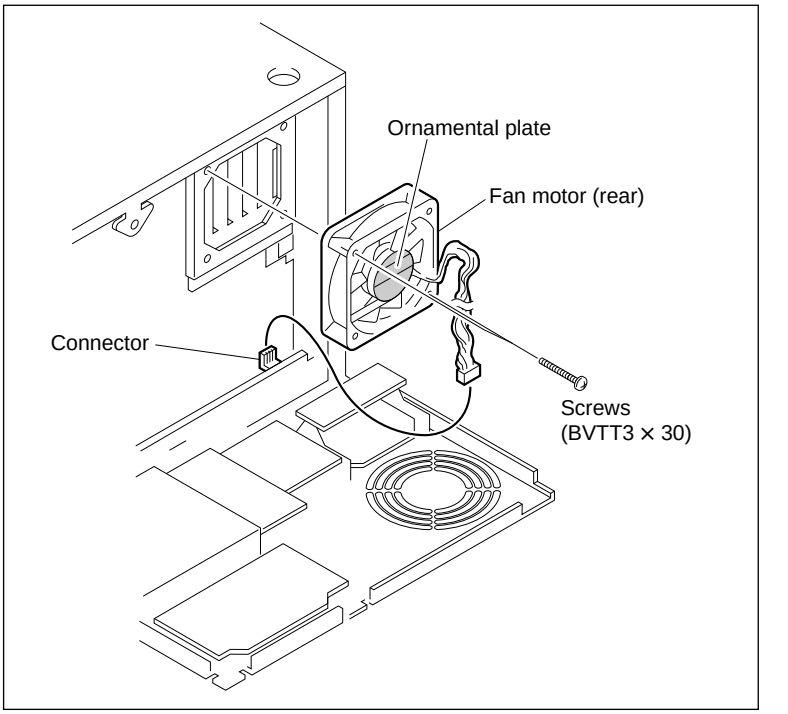
(1) Disconnect the harness of the fan motor (rear) from the connector shown in the figure.
(2) Loosen the two screws and remove the fan motor (rear).

3. Install the Fan Motor (Rear)

(1) Install a new fan motor (rear) so that the ornamental plate faces to outside and harness is bottom right side, and tighten the two screws.
(2) Connect the connector of the fan motor (rear).

4. Install the Connector Panel

Install the connector panel and tighten the six screws.



Remove/Install the Fan Motor (Rear)

3-28-2. Fan Motor (PS) Replacement

Outline

Replacement

1. Remove the Power Supply Panel Assembly
2. Remove the Fan Motor (PS)
3. Install the Fan Motor (PS)
4. Install the Power Supply Panel Assembly

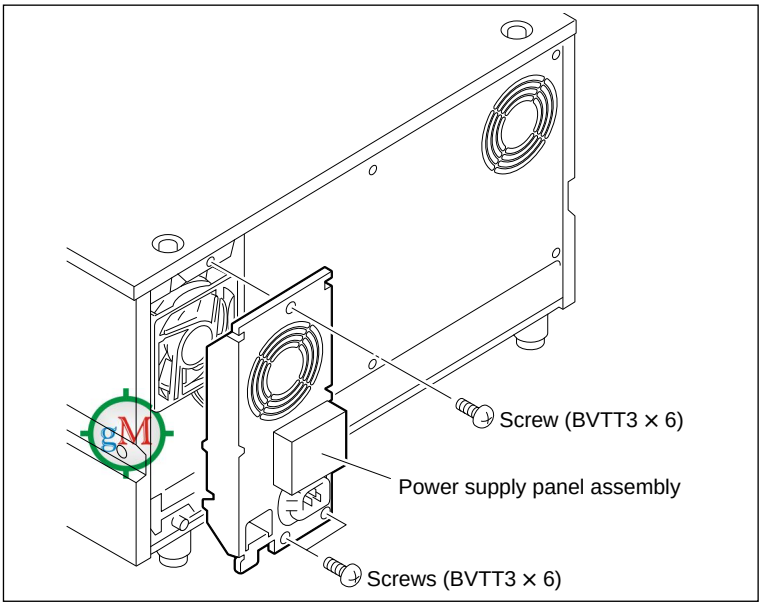
Removal

1. Remove the Power Supply Panel Assembly

Loosen the three screws and remove the power supply panel assembly.

Note

It is not neccessary to disconnect the harness connected to the power supply panel assembly.



Remove the Power Supply Panel Assembly

2. Remove the Fan Motor (PS)

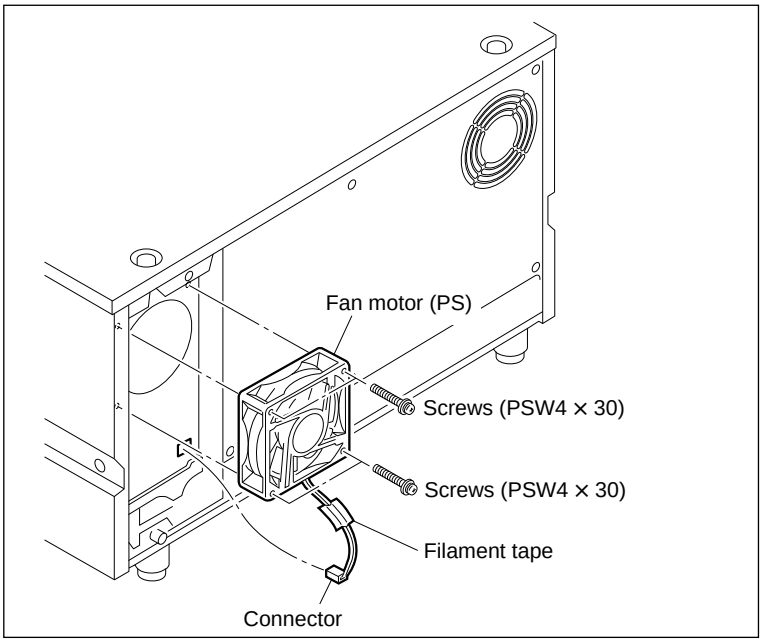
(1) Take off the filament tape fixing the harness of the fan motor (PS).
(2) Disconnect the harness of the fan motor (PS) from the connector shown in the figure.
(3) Loosen the four screws and remove the fan motor (PS).

3. Install the Fan Motor (PS)

(1) Install a new fan motor (PS) so that the ornamental plate faces to outside and harness is bottom left side, and tighten the four screws.
(2) Connect the connector of the fan motor (PS).
(3) Stick a filament tape to fix the harness of the fan motor (PS).

4. Install the Power Supply Panel Assembly

Install the power supply panel assembly and tighten the three screws.



Remove/Install the Fan Motor (PS)

3-28-3. Fan Motor (MD) Replacement

Outline

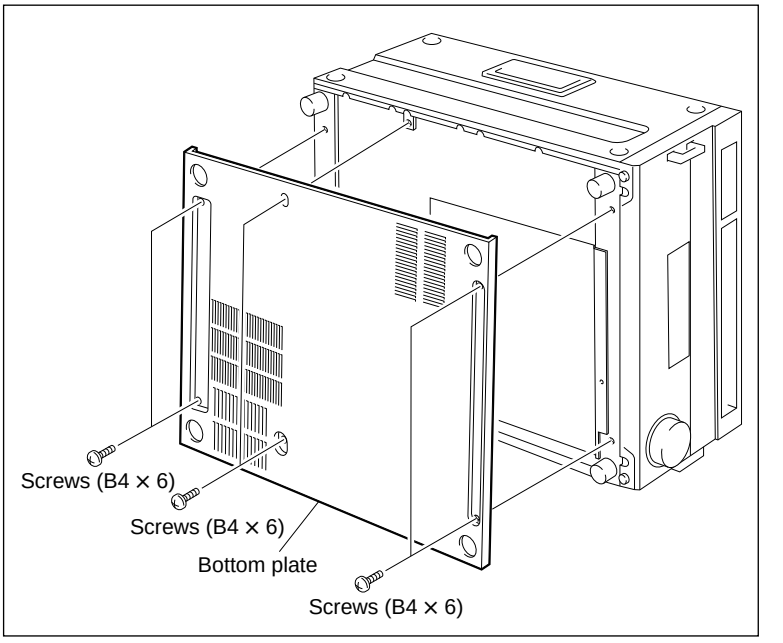
Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Replace the Fan Motor (MD)
4. Install the Fan Motor (MD)
5. Install the Shield Plate (Bottom)
6. Install the Bottom Plate

Removal

1. Remove the Bottom Plate

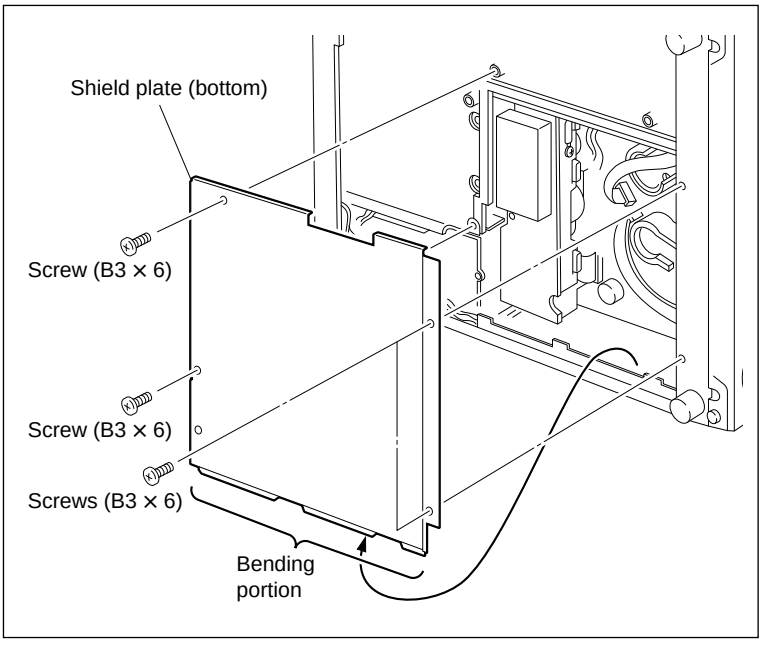
(1) Place the unit on its right side panel down.
(2) Loosen the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

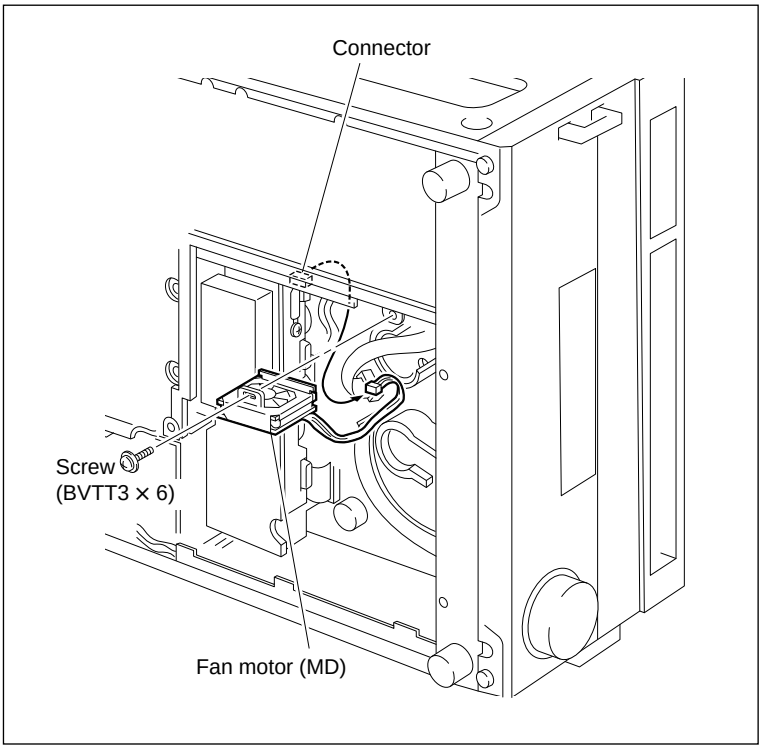
Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

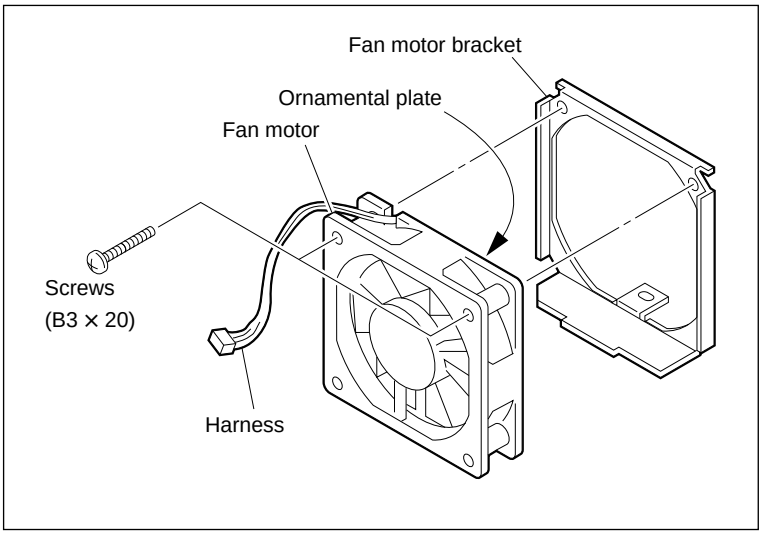
3. Replace the Fan Motor (MD)

(1) Disconnect the connector shouwn in the figure.
(2) Loosen a screw and remove the fan motor (MD).



Replace the Fan Motor (MD)

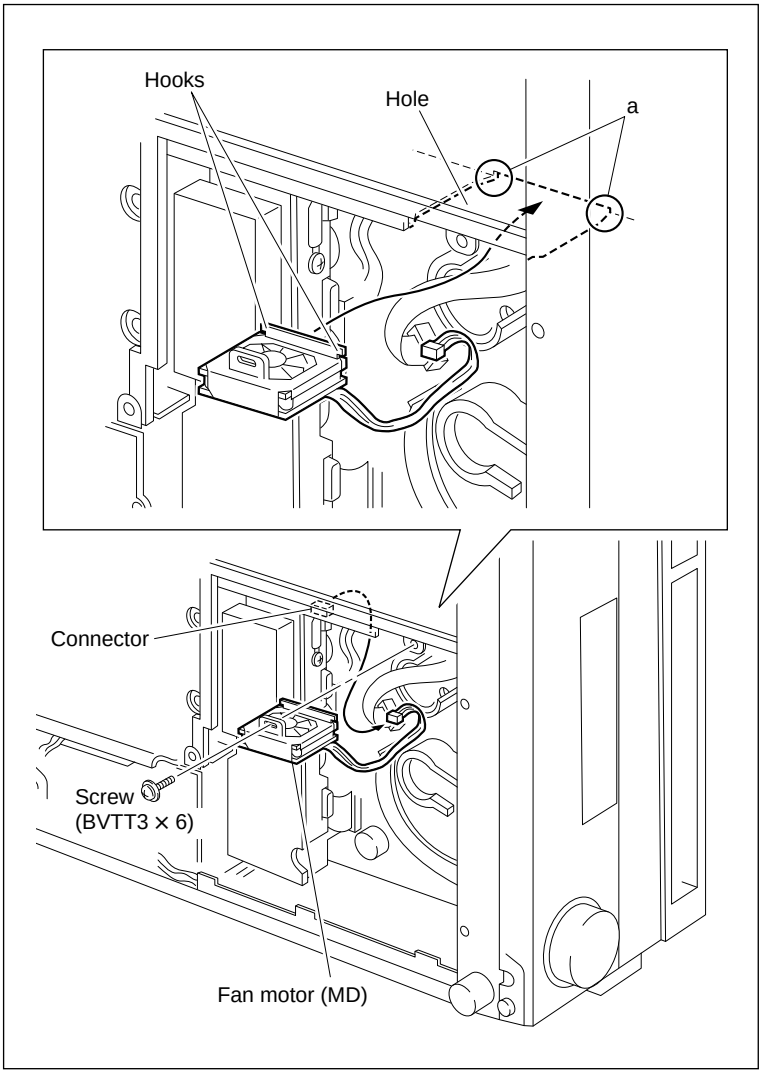
(3) Loosen the two screws and remove the fan motor (MD) from the fan motor bracket.
(4) Install the fan motor (MD) to the fan motor bracket so that the ornamental plate faces to side of the fan motor bracket and the harness is top left side, and tighten the two screws.



Replace the Fan Motor (MD)

4. Install the Fan Motor (MD)

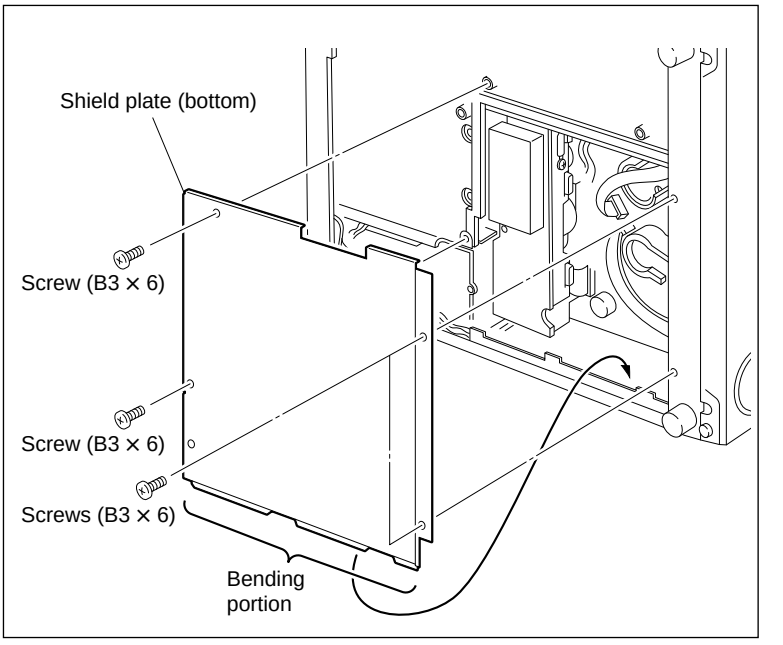
(1) Put the hook of the fan motor bracket to the portions “a” of the chassis.
(2) Install the fan motor (MD) and tighten the screw.
(3) Connect the harness of the fan motor (MD) to the connector (CN161).



Install the Fan Motor (MD)

5. Install the Shield Plate (Bottom)

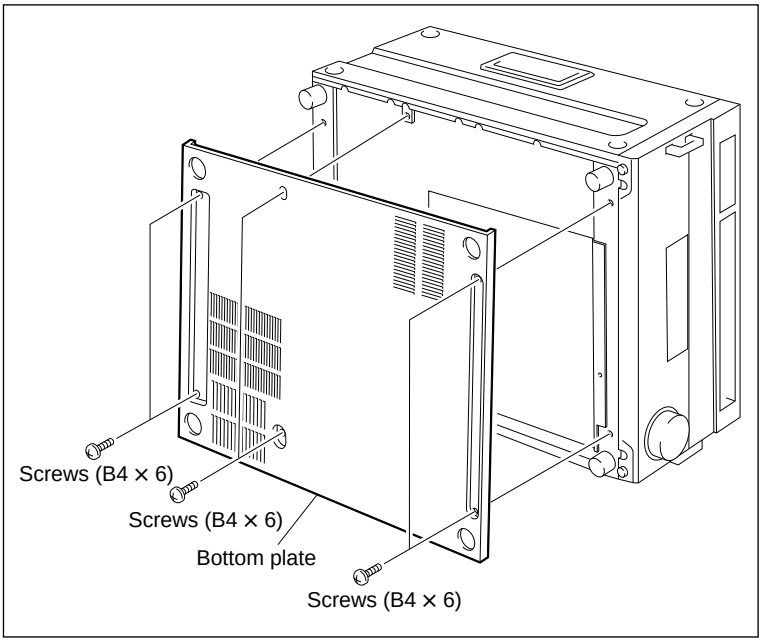
Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

6. Install the Bottom Plate

Tighten the bottom plate with six screws.



Install the Bottom Plate

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3-29. Power Supply Unit Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Disconnect the Harness
3. Remove the Power Supply Panel Assembly
4. Remove the Power Supply Unit
5. Install the Power Supply Unit
6. Install the Power Supply Panel Assembly
7. Connect the Harness
8. Install the Bottom Plate
9. Confirm the Operation

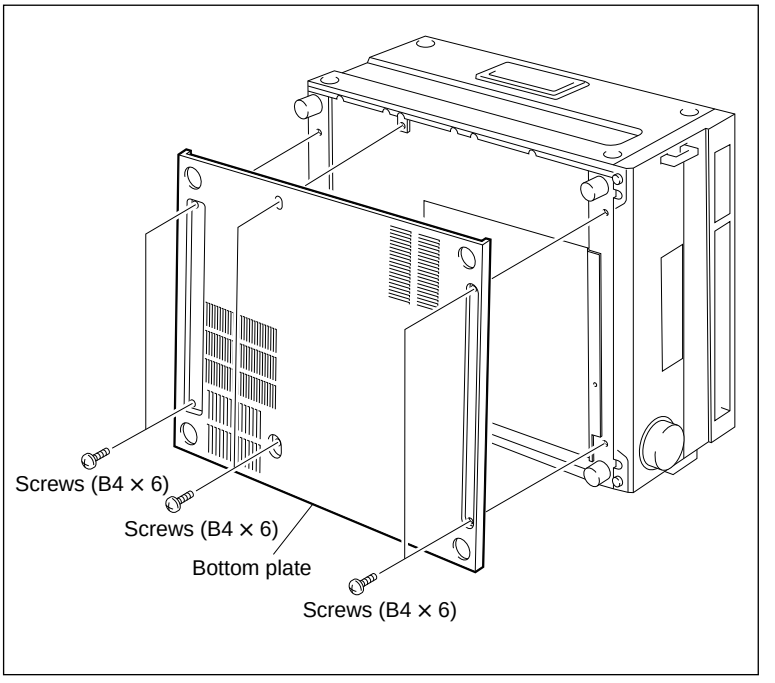
Preparation

1. Turn the power off and then wait over 30 seconds.
2. Remove the power supply cord plug from the outlet.

Removal

1. Remove the Bottom Plate

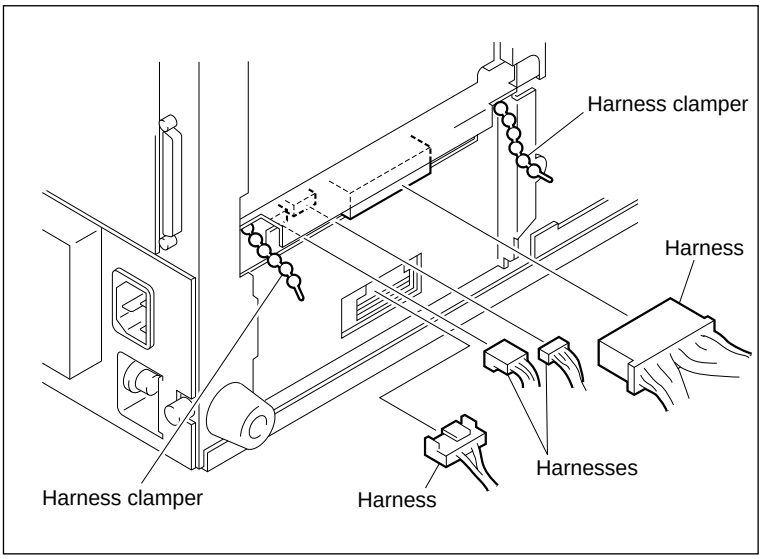
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Disconnect the Harness

(1) Release the two harness clampers as shown in the figure.
(2) Disconnect the four harnesses.



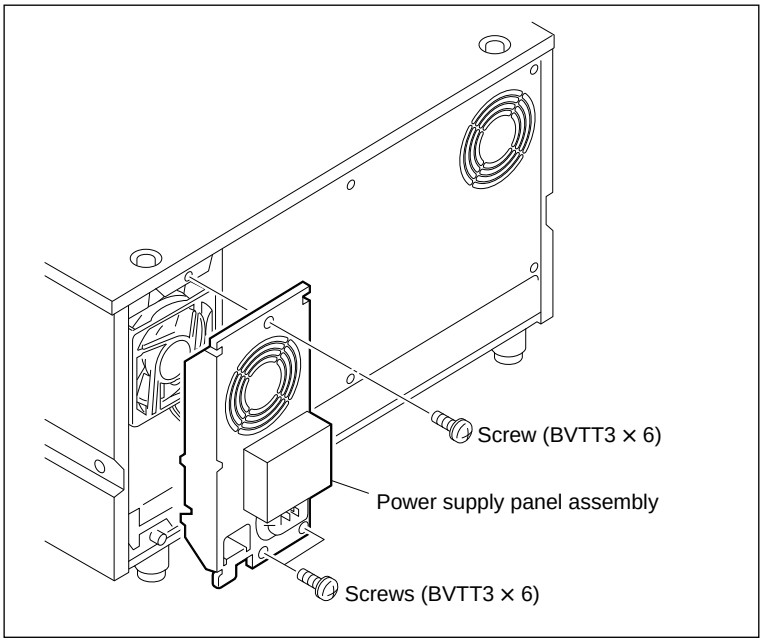
Disconnect the Harness

3. Remove the Power Supply Panel Assembly

Remove the three screws and open the power supply panel assembly.

Note

It is not necessary to disconnect the harness connected to the power supply panel assembly.



Remove the Power Supply Panel Assembly

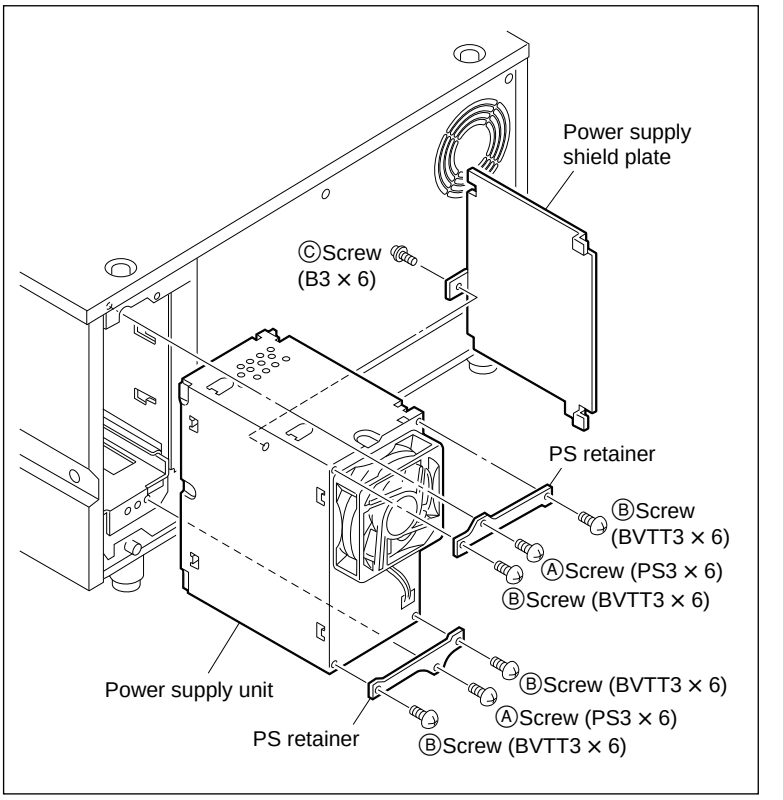
4. Remove the Power Supply Unit

(1) Remove the two screws (Ⓐ).
(2) Pull out the power supply block.

Installation

5. Install the Power Supply Unit

(1) Remove the four screws (Ⓑ) and remove the two PS retainers.
(2) Remove a screw (Ⓒ), then remove the power supply shield plate.
(3) Install the two PS retainers to new power supply unit and tighten the four screws (Ⓑ).
(4) Install the power supply shield plate to new power supply unit and tighten a screw (Ⓒ).
(5) Install the power supply unit and tighten the two screws (Ⓐ).



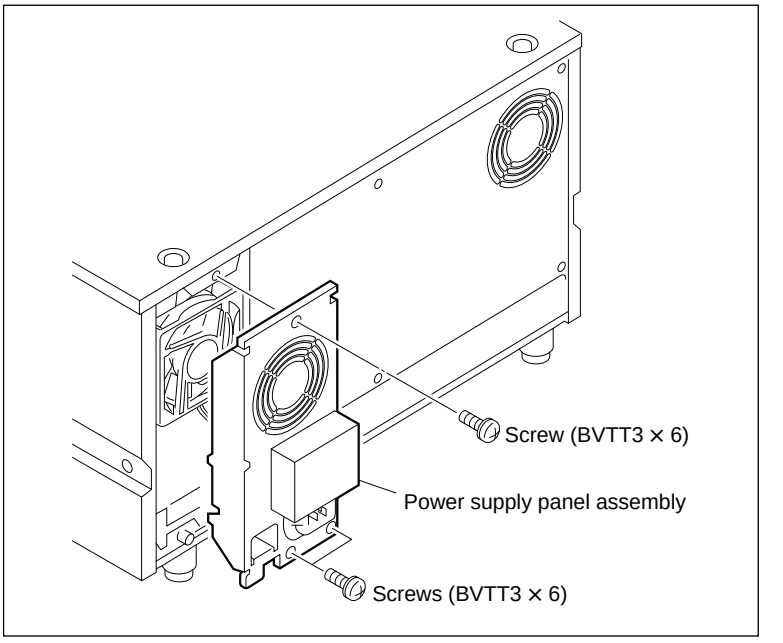
Remove/Install the Power Supply Unit

6. Install the Power Supply Panel Assembly

Install the power supply panel assembly and tighten the three screws.

Note

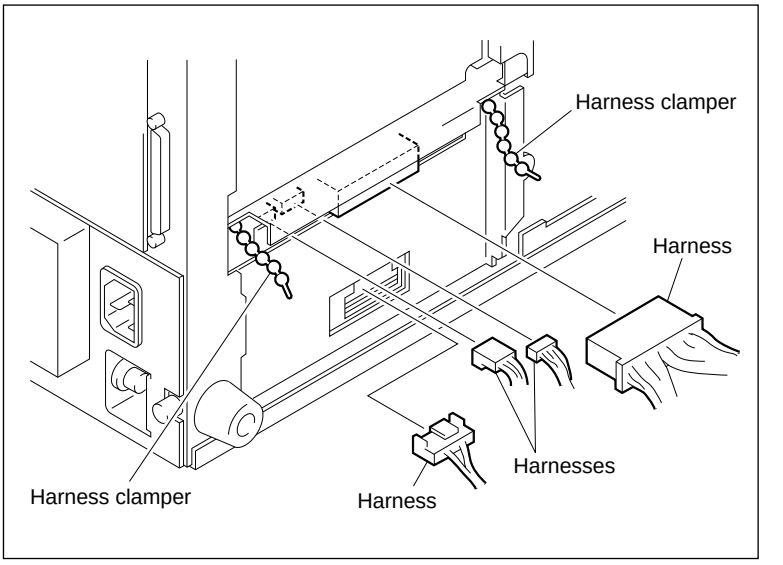
Be careful not to catch the harness.



Install the Power Supply Panel Assembly

7. Connect the Harness

(1) Connect the each harness to four connectors shown in the figure.
(2) Hold the harnesses using a harness clamper.



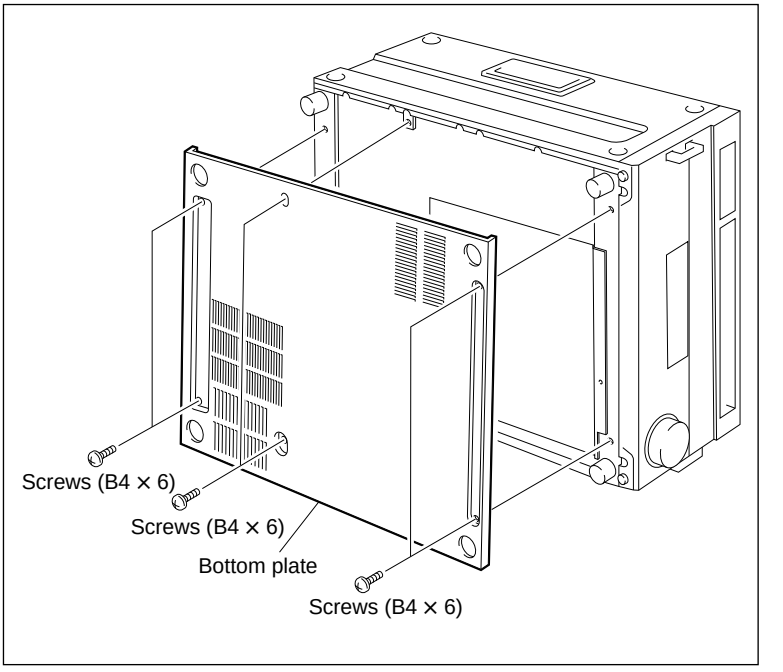
Connect the Harness

8. Install the Bottom Plate

(1) Install the bottom plate and tighten the six screws.
(2) Put the unit back.

9. Confirm the Operation

Turn the power on and confirm the unit runs in normal condition.



Install the Bottom Plate

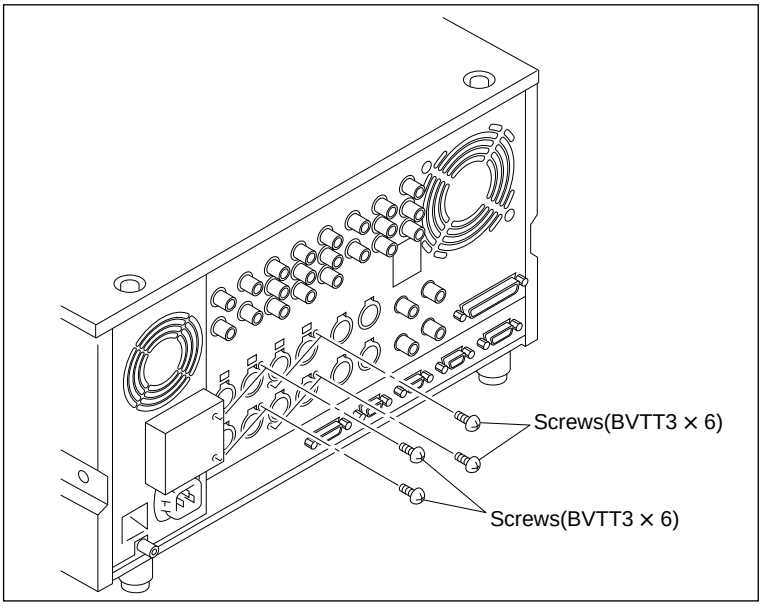
3-30. Mounted Circuit Board Replacement

This section explains the replacement procedures of circuit boards except plug-in boards.
Refer to Section 6 of the maintenance manual part 1 for piug-in board replacement.

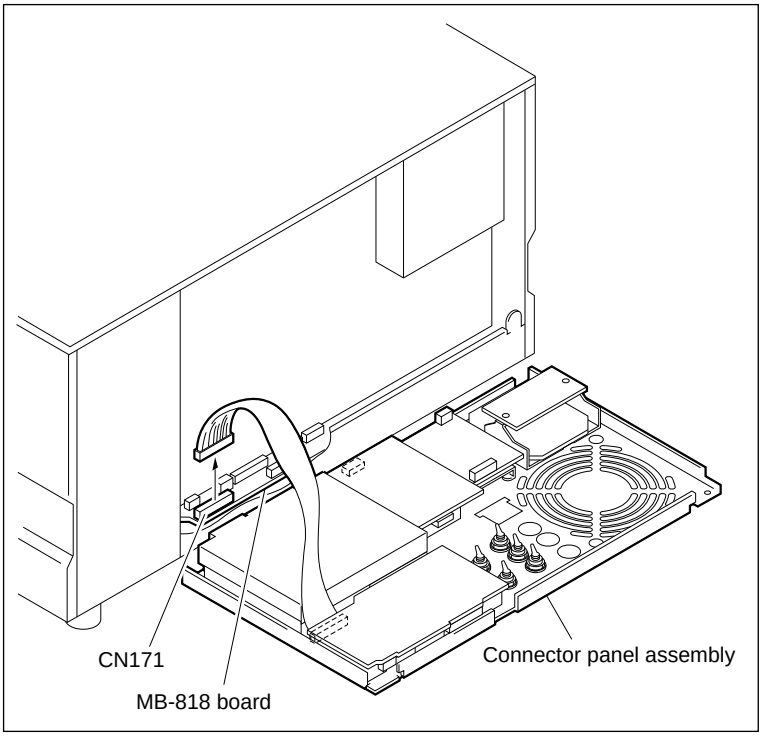
3-30-1. CP-278 Board

Replacement

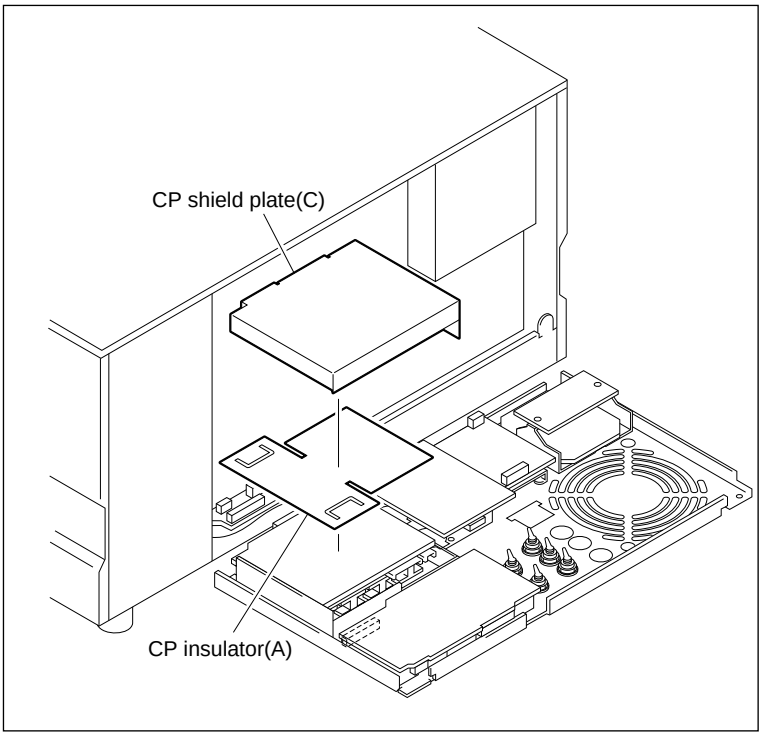
1. Turn the power off.
2. Remove the eight screws (BVTT 3 × 6).



3. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
4. Disconnect the harness from the connector (CN171) on the MB-818 board.



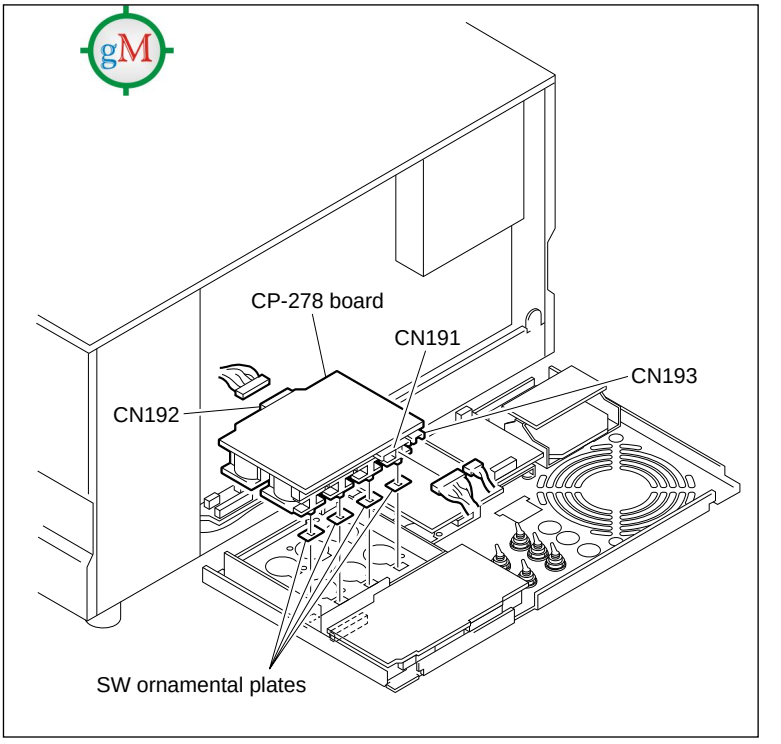
5. Remove the CP shield plate (C) and CP insulator (A).



6. Disconnect the harnesses from the connectors (CN191, CN192 and CN193) on the CP-278 board, then remove the CP-278 board.

Note

In this way the four SW ornamental plates will remove.
Be carefull not to lose them.



7. Install the CP-278 board in the reverse order of steps 2 through 8.

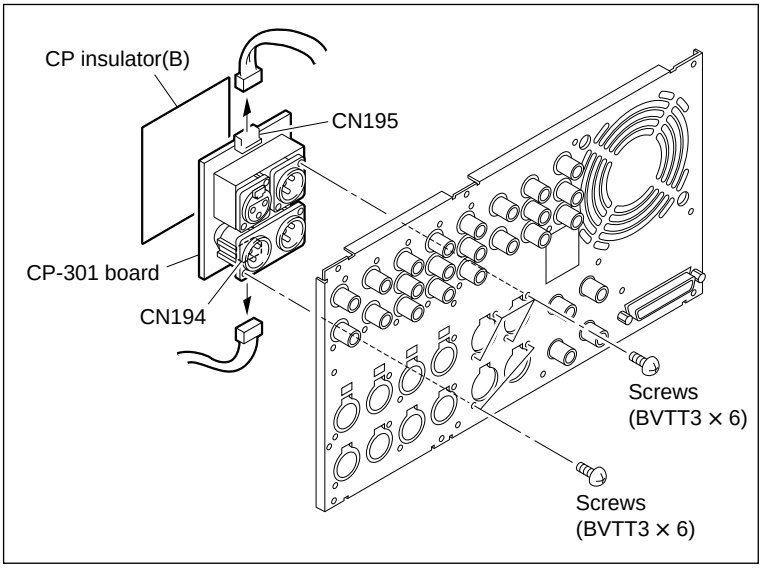
Confirmation after replacement

Confirm the input/output level of each analog audio channel.
(Refer to Section 1-9-6.)

3-30-2. CP-301 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Remove the six screws as shown in the figure.
4. Disconnect the hernesses from the connectors (CN194 and CN195) on the CP-301 board, then remove the CP-301 board.
5. Peel off the CP insulator (B).



6. Install the CP-301 board in the reverse order or steps 2 through 5.

Note

Adjustment after replacement is not required.

3-30-3. CP-334 Board

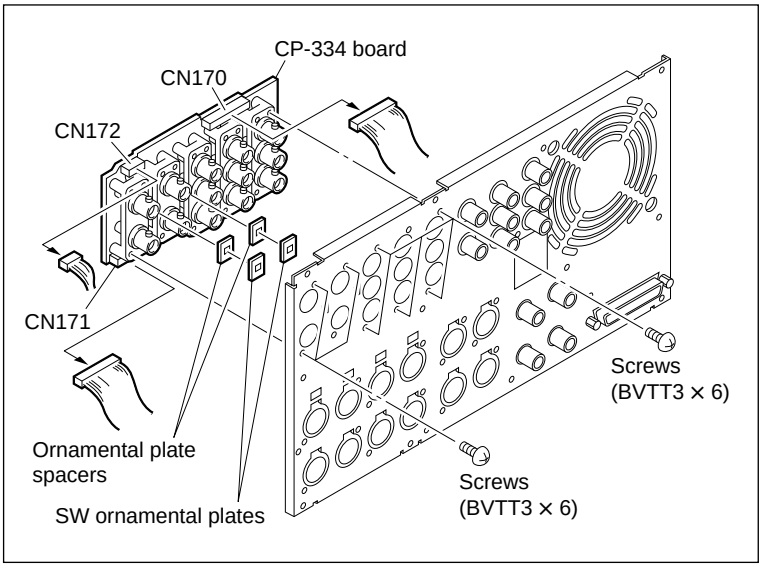
Replacement

1. Turn the power off.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Remove the ten screws shown in the figure.
4. Disconnect the harnesses from the connectors (CN170,CN171 and CN172) on the CP-334 board, then remove the CP-334 board.

   Note

   Two SW ornamental plates and two ornamental plate spacers can be removed in this case.

   Be careful not to lose them.
5. Install the CP-334 board in the reverse order of steps 2 through 4.



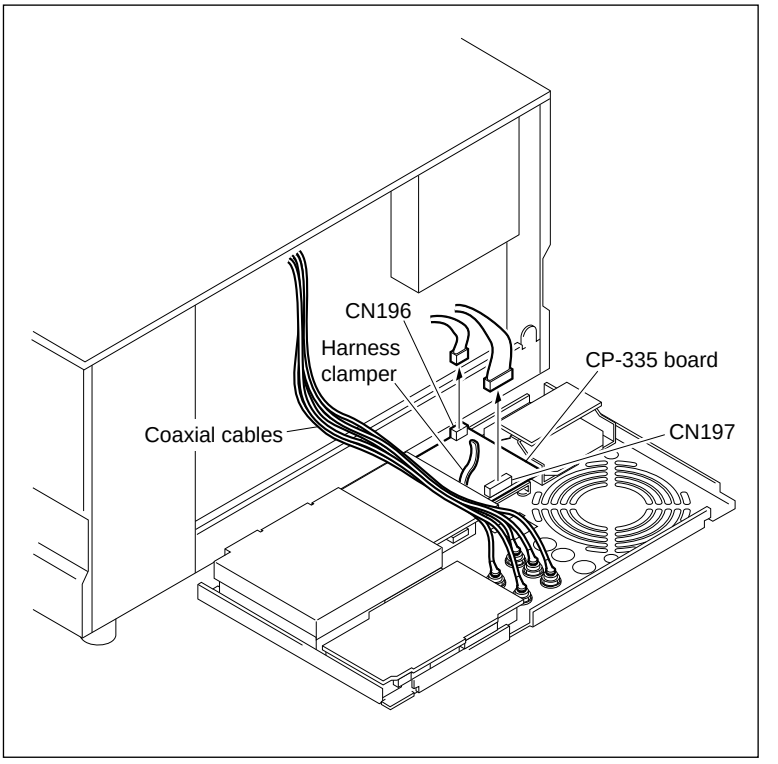
Confirmation after replacement

6. Confirm that the composite/component video output signals are normal. (Refer to Section 1-9-8.)

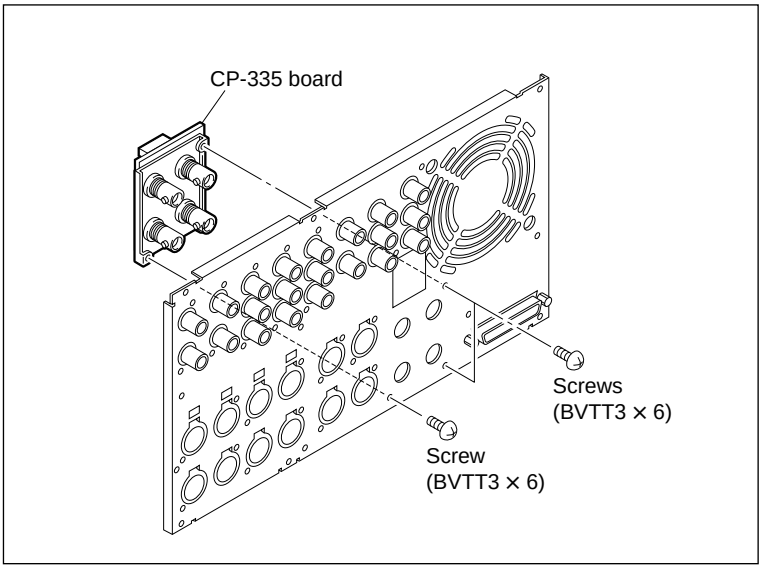
3-30-4. CP-335 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Open the harness clamper and release the coaxial cables.
4. Disconnect the harnesses from the connectors (CN196 and CN197) on the CP-335 board.



5. Remove the three screws as shown in the figure, then remove the CP-335 board.



6. Install the CP-335 board in the reverse order of steps 2 to 5.

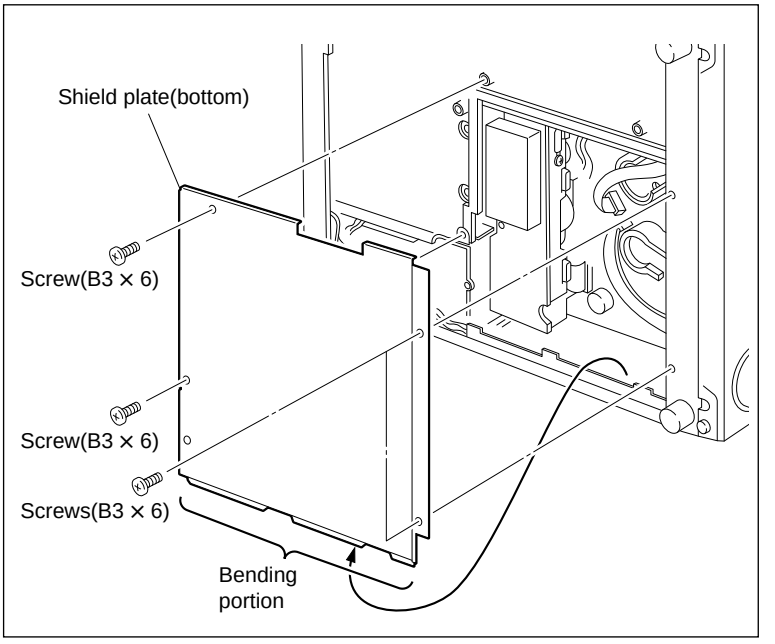
Confirmation after replacement

7. Confirm the input/output level of each AES/EBU channel. (Refer to Section 1-9-9.)

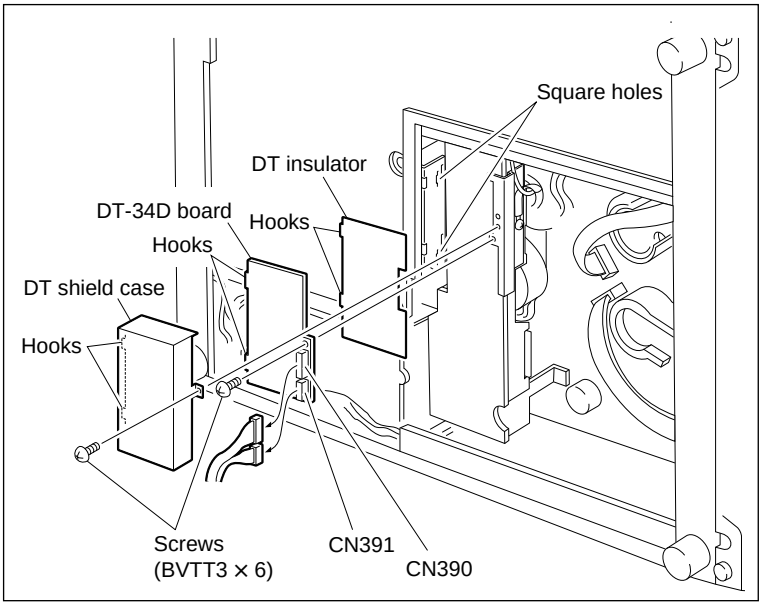
3-30-5. DT-34D Board

Replacement

1. Turn off the power.
2. Put the unit with the right side panel down and remove the bottom plate. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the four screws, and then remove the shield plate (bottom).



4. Remove the screw, remove the two hooks from the square holes of the chassis, and then remove the DT shield case.
5. Disconnect the harnesses from connectors CN390 and CN391 on the DT-34D board.
6. Remove the screw, remove the two hooks from the square holes of the chassis, and then remove the DT-34D board and DT insulator.
7. Install the DT-34D board in the reverse order of steps 2 to 6.



Adjustment after replacement

8. Perform the DT system electrical adjustment. (Refer to Sections 2-5-6 and 2-5-9.)

3-30-6. DR-315 Board

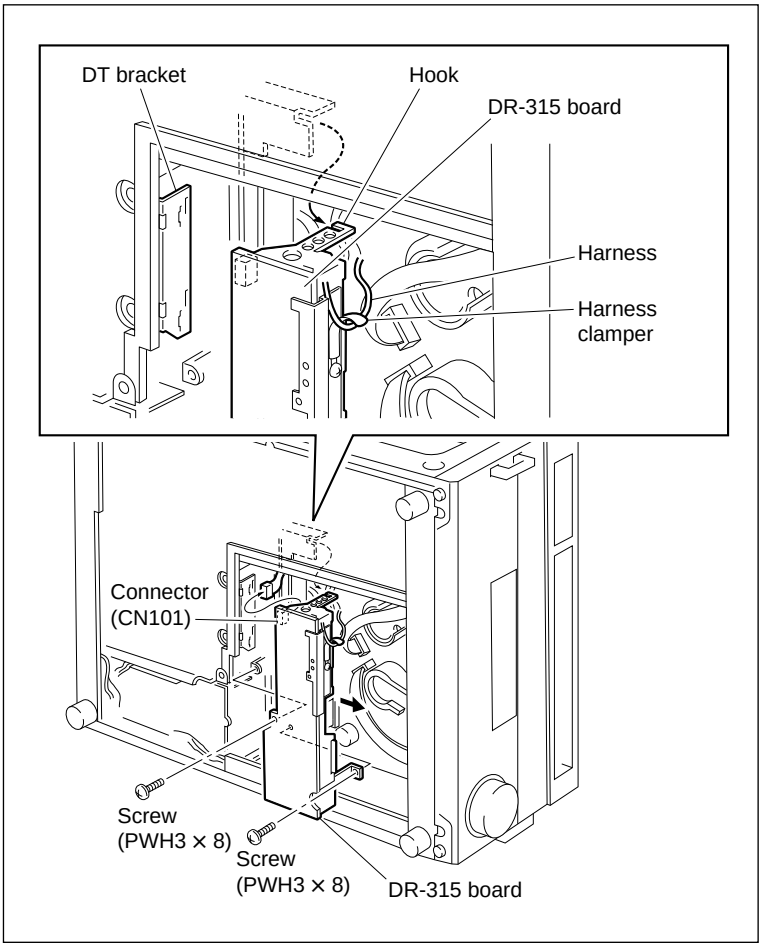
Replacement

1. Turn off the power.
2. Put the unit with the right side panel down and remove the bottom plate.
   (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the shield plate (bottom).
   (Refer to Section 3-30-5.)
4. Remove the DT-34D board.
   (Refer to Section 3-30-5.)
5. Stretch the harness clamper on the DR-315 board and release the harnesses.
6. Remove the two screws shown in the figure.
7. Move the DR-315 board toward the reel motors, and detach the hook.

   Note

   The hook is hard to be seen since it is the inner part.

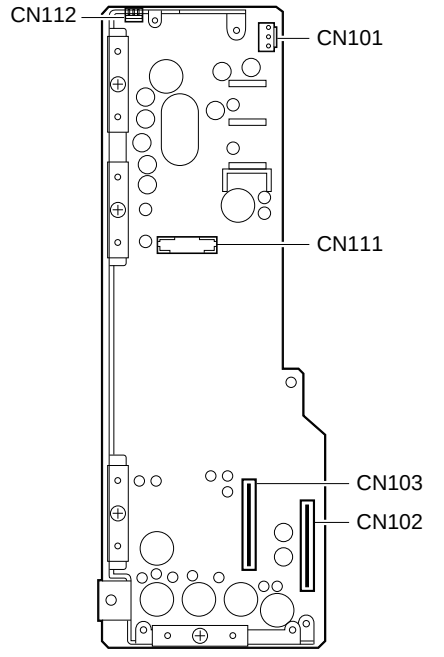
8. Pull out the DR-315 board as far as possible as shown in the figure.



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9. Disconnect the hernesses and the flexible board from the connectors (CN101, CN102, CN103, CN111 and CN112) on the DR-315 board, then remove the DR-315 board.

<DR-315 board, side A>



10. Install the DR-315 board in the reverse order of steps 2 through 9.

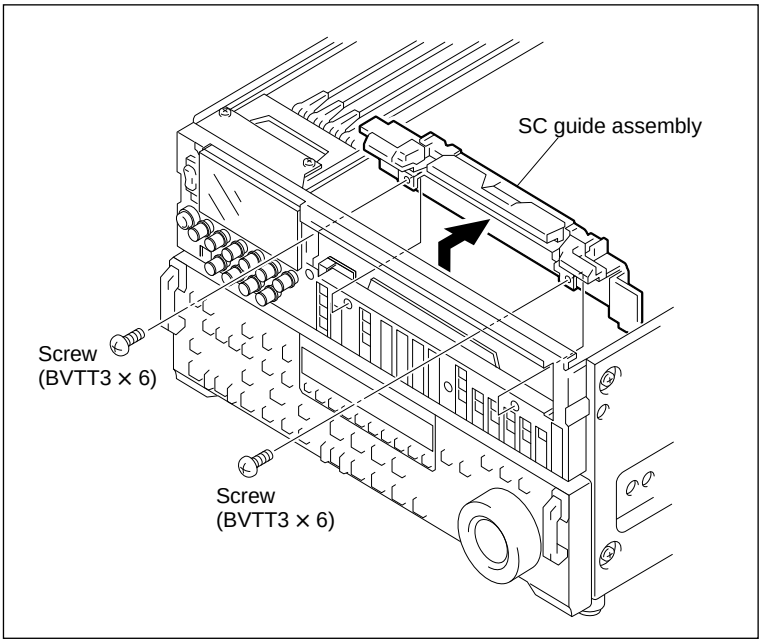
Adjustment after replacement

11. Perform the servo system electrical adjustment.
(Refer to Sections 2-5-3 and 2-5-5.)

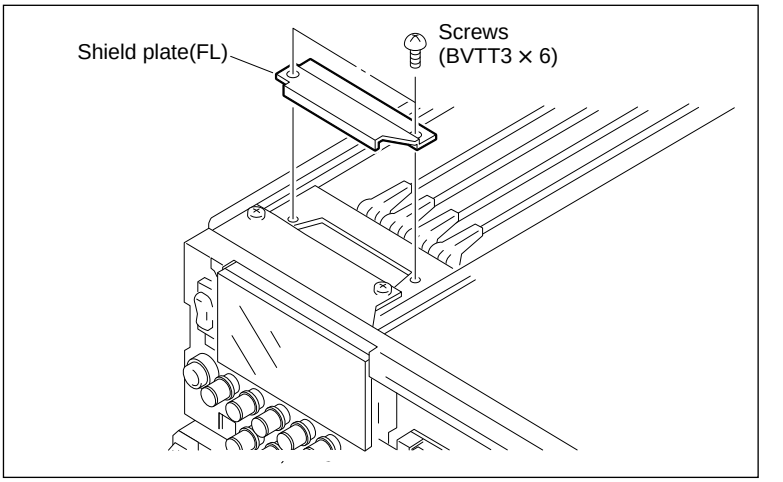
3-30-7. FP-117 Board

Replacement

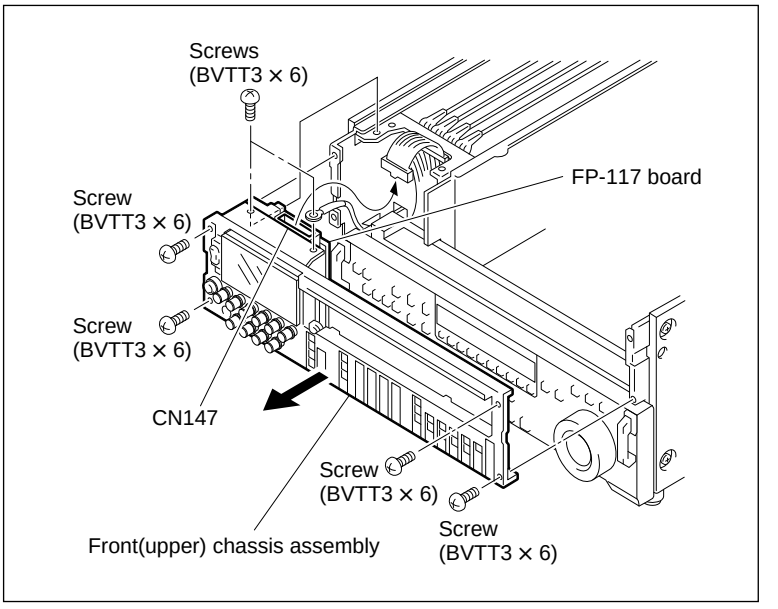
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the two screws, then remove the SC guide assembly.



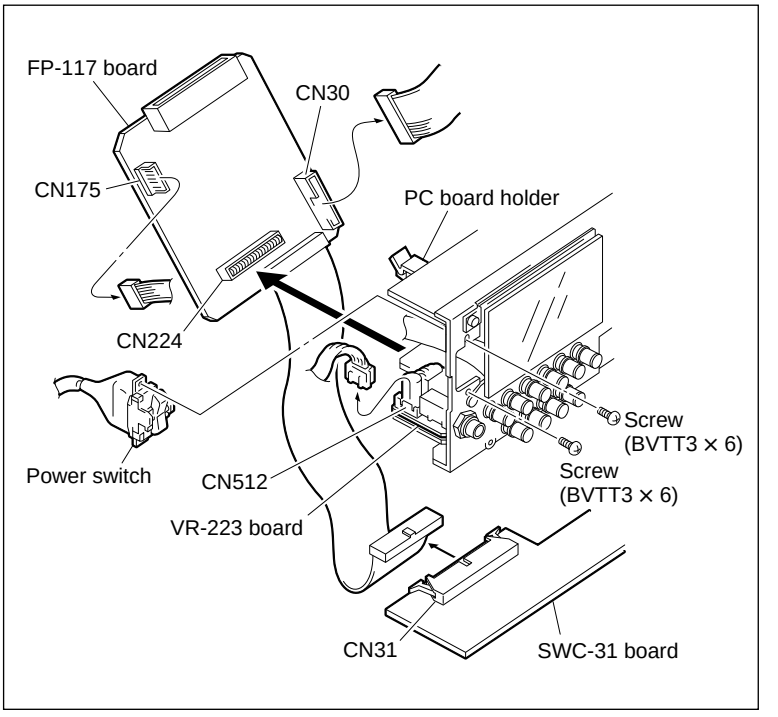
7. Remove the two screws, and then remove the shield plate (FL).



8. Disconnect the flat cable from the connector (CN147) on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



10. Remove the two screws, then remove the power switch.
11. Undo the PC board holder, then open the FP-117 board.
12. Disconnect the flat cable from the connector (CN30) on the FP-117 board.
13. Disconnect the harness and the flat cables from the connector (CN512) on the VR-223 board, connector (CN175, CN31) on the FP-117 board, and remove the front (upper) chassis assembly.
14. Disconnect the harness from the connector (CN224) on the FP-117 board, then remove the FP-117 board.
15. Install the FP-117 board in the reverse order of steps 2 through 14.



Notes

When connecting the connector (CN224), put the protrusions of the connector on the VR-224 board in the hollow of CN224, then put the FP-117 board vertically.

Adjustment after replacement

16. Perform the remote control offset adjustment. (Refer to Section 2-12.)

3-30-8. KY-438 Board

Replacement

1. Turn off the power.
2. Remove the lower control panel assembly. (Refer to Section 2-6 of the maintenance manual part1.)
3. Remove the six screws shown in the figure, then remove the KY protector and KY-438 board.

   Note

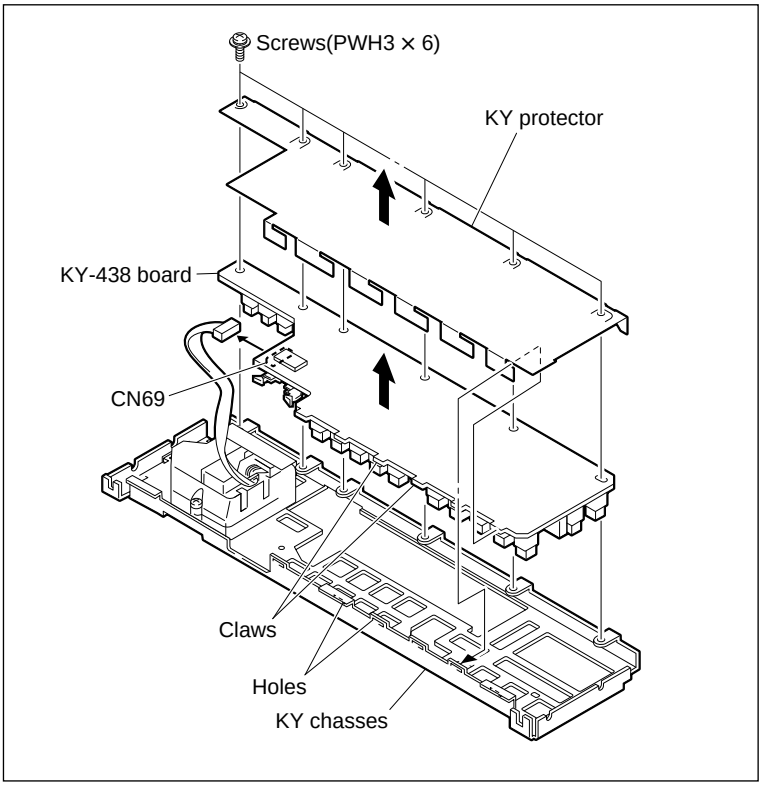
   While pulling out the claws of the KY-438 board from the holes of the KY chassis, remove the KY protector and KY-438 board simultaneously.

4. Disconnect the harness from the connector (CN69).

5. Install the KY-438 board in the reverse order of steps 2 through 4.

Note

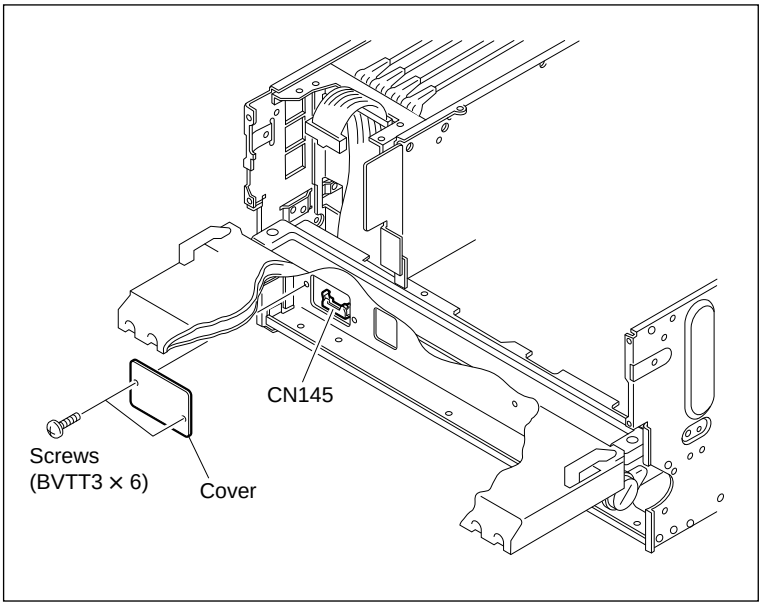
Adjustment after replacement is not required.



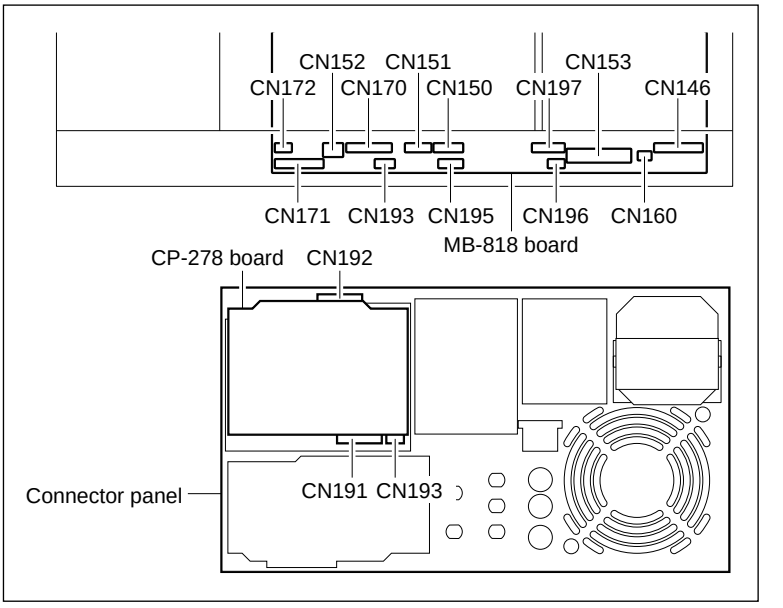
3-30-9. MB-818 Board

Replacement

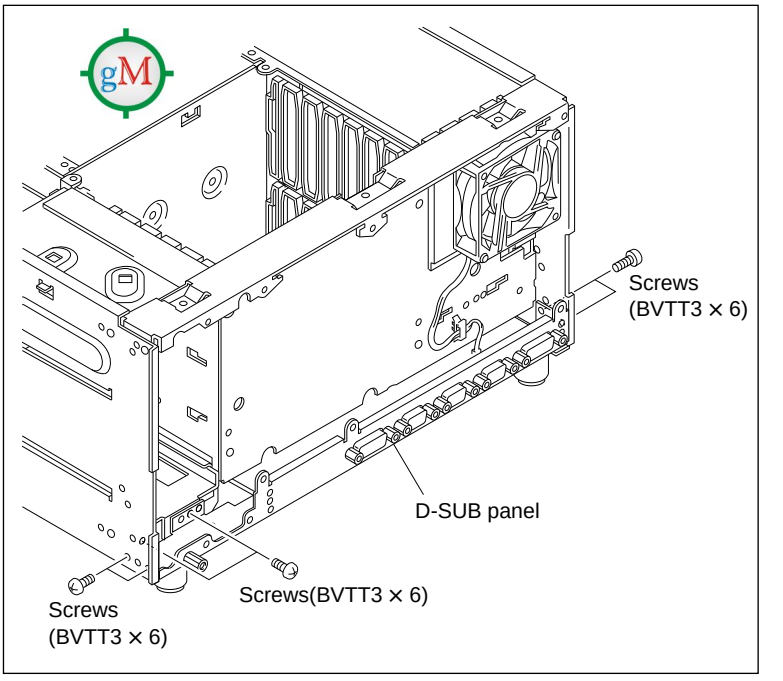
1. Turn off the power.
2. Remove the upper lid.
   (Refer to the Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Pull out the all plug-in boards.
   (Refer to Section 2-13 of the maintenance manual part1.)
8. Remove the right side panel.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
9. Remove the left side panel.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
10. Remove the two screws, and then remove the cover.
11. Disconnect the flat cable from connector CN145 on the MB-818 board.
12. Remove the power supply panel assembly.
    (Refer to Section 2-3-4 of the maintenance manual part1.)



13. Remove the connector panel assembly.
    (Refer to Section 2-3-3 of the maintenance manual part1.)
14. Disconnect the harnesses from the connectors below on the MB-818 board.
    - Power supply unit harnesses
      CN150, CN151, CN152, and CN153
    - Connector panel harnesses
      CN146, CN170, CN171, CN172, CN193, CN195, CN196, and CN197
    - Fan motor (rear) harness
      CN160
15. Disconnect the harnesses from the connectors CN191, CN192, and CN193 on the CP-278 board. (Refer to Section 3-30-1.)

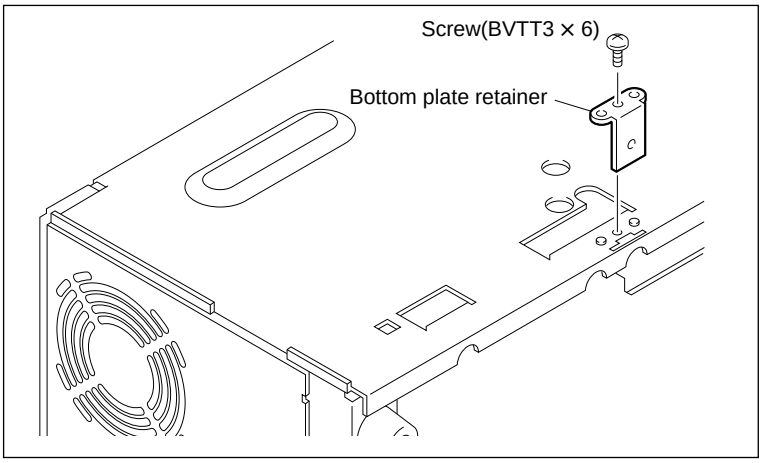


16. Remove the six screws fixing the D-Sub panel.

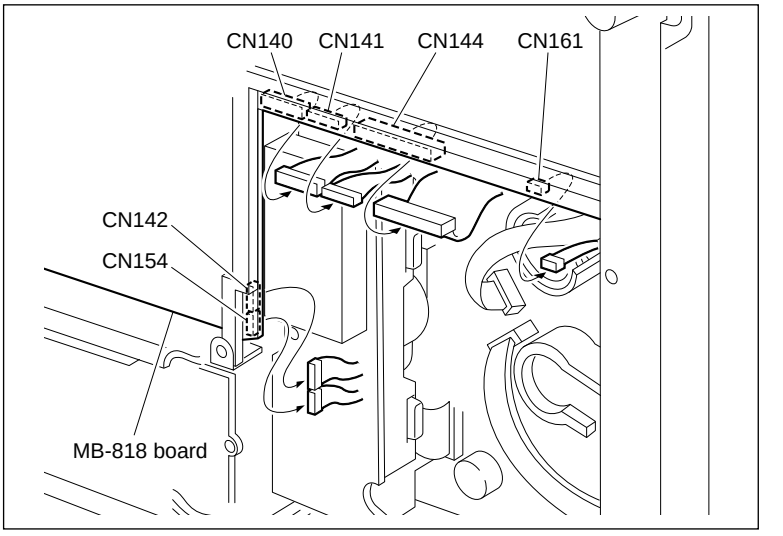


17. Put the unit with the right side plate down and remove the bottom plate.
    (Refer to Section 2-3-1 of the maintenance manual part1.)
18. Remove the four screws, and then remove the shield plate (bottom).
    (Refer to Section 3-30-5.)

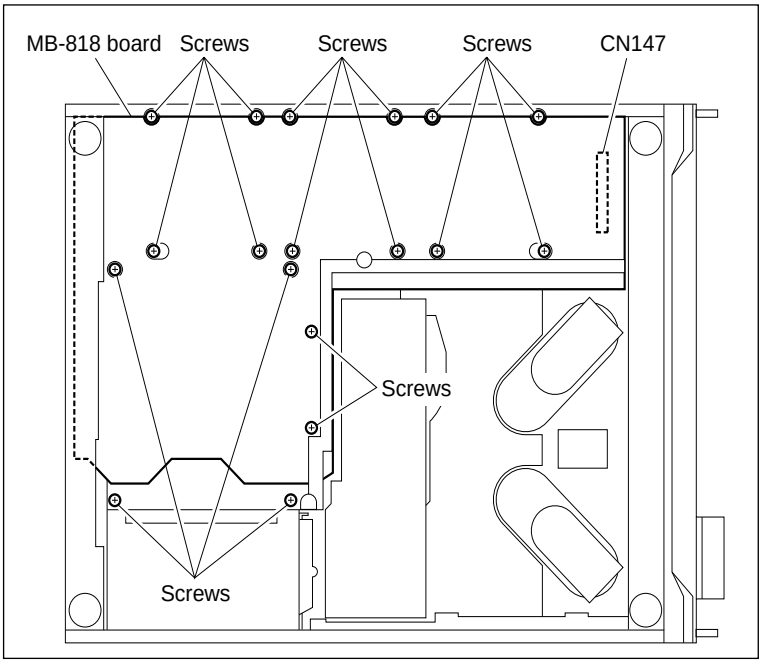
19. Remove the screw and remove the bottom plate retainer.



20. Remove the DT-34D board. (Refer to Section 3-30-5.)
21. Disconnect the harnesses and flat cable from connectors CN140, CN141, CN142, CN144, CN154, and CN161.



22. Remove the eighteen screws and remove the MB-818 board.
23. Disconnect the flat cable from connector CN147 on the MB-818 board.

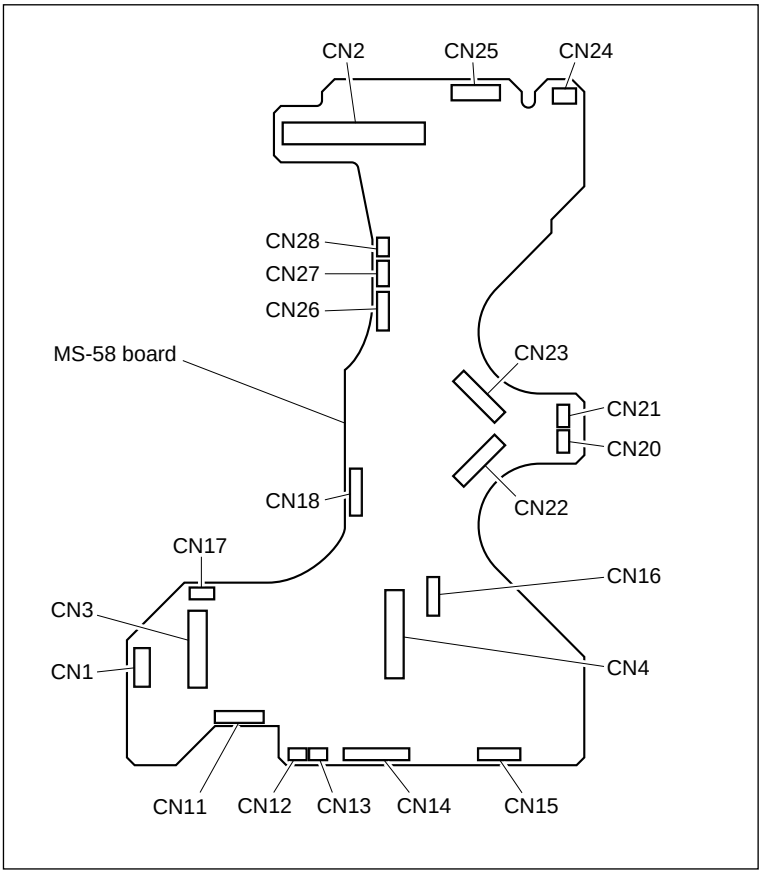


24. Install the MB-818 board in the reverse order of steps 2 through 23.
25. Turn the power on and confirm the unit runs in normal condition.

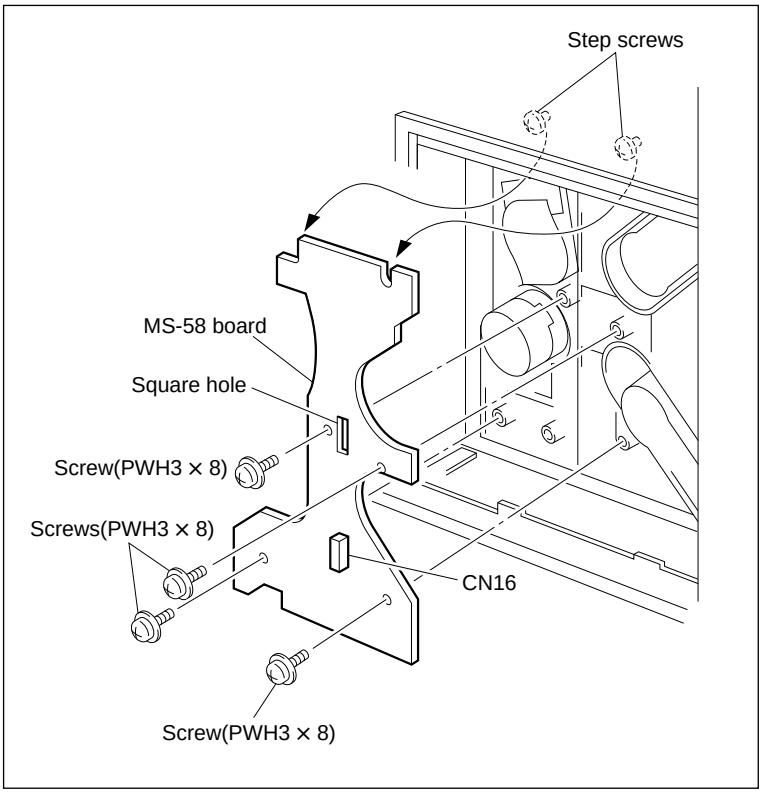
3-30-10. MS-58 Board

Replacement

1. Turn off the power.
2. Remove the DR-315 board.
   (Refer to Section 3-30-6.)
3. Disconnect the harnesses, flat cable or flexible card wires from the connectors CN1, CN2, CN3, CN4, CN11, CN12, CN13, CN14, CN15, CN16, CN17, CN18, CN20, CN21, CN22, CN23, CN24, CN25, CN26, CN27 and CN28 on MS-58 board.



4. Remove the four screws as shown in the figure.
5. Slide the MS-58 board toward the right side panel, and take off the upper side of MS-58 board from the two step screws.



6. Install the MS-58 board in the reverse order of steps 2 to 5.

Note

The MC sensor harness (connected to the connector CN16 on the MS-58 board) requires to thread in the square hole on the center portion of the MS-58 board.

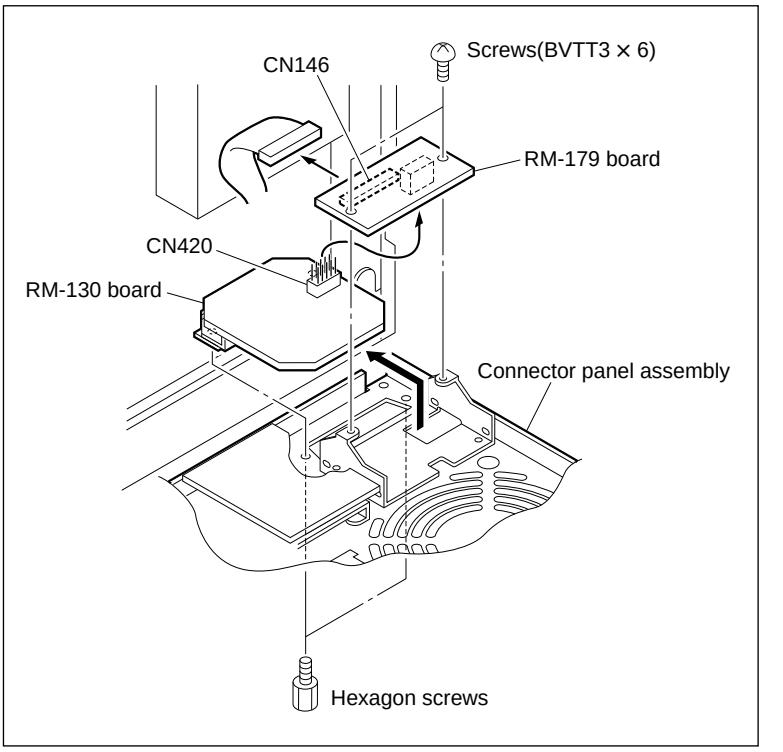
Adjustment after Replacement

7. Perform the whole servo system electrical adjustment.
   (Refer to Section 2-5.)

3-30-11. RM-130/RM-179 Boards

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Disconnect the harness from connector CN146 on the RM-179 board.
4. Remove the two screws, and then remove the RM-179 board from connector CN420 on the RM-130 board.
5. Remove the two hexagon head screws, and then remove the RM-130 board in the direction indicated by the arrow.
6. Install the RM-130 and RM-179 boards in the reverse order of steps 2-5.



Adjustment after replacement (RM-179 Board)

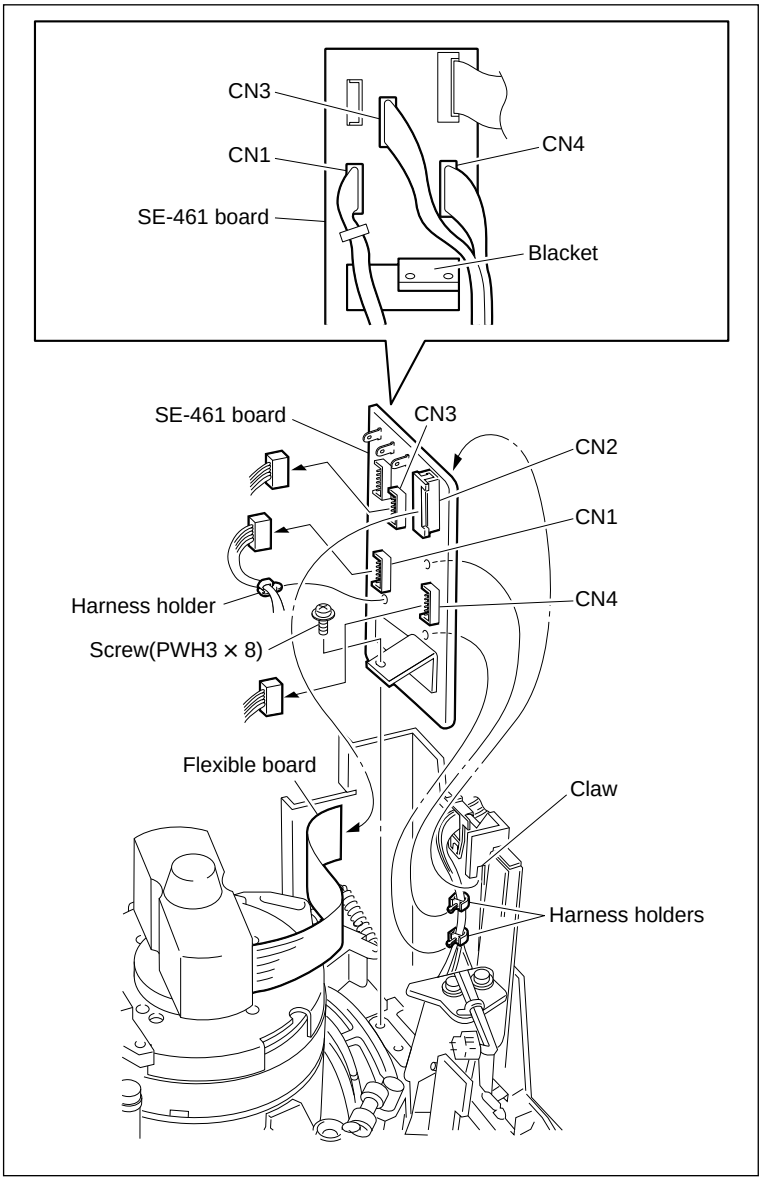
7. Save the set data. (Refer to Section 1-9-29.)

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3-30-12. SE-461 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Disconnect each harness and flexible board from the connector (CN1, CN2, CN3 and CN4) on the SE-461 board.
5. Push out the fastening portion of the three harness holders shown in the figure using a pair of long-nose pliers or etc. from the board, then remove them.
6. Loosen the screw and slide the SE-461 board to unlock from the claw, then remove the SE-461 board.



7. Install the SE-461 board in the reverse order of steps 2, 3, 4, 6, 5.

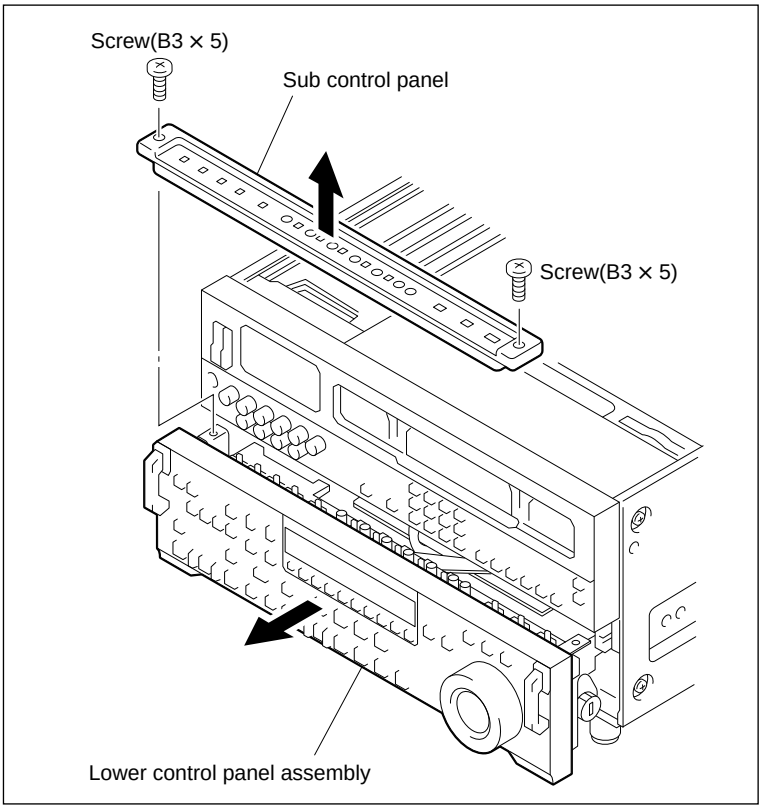
Confirmation after replacement

8. Confirm that the dew sensor functions normally.
   Refer to Section 4-2-2 of the maintenance manual part1.
   (C003: DEW SENSOR)

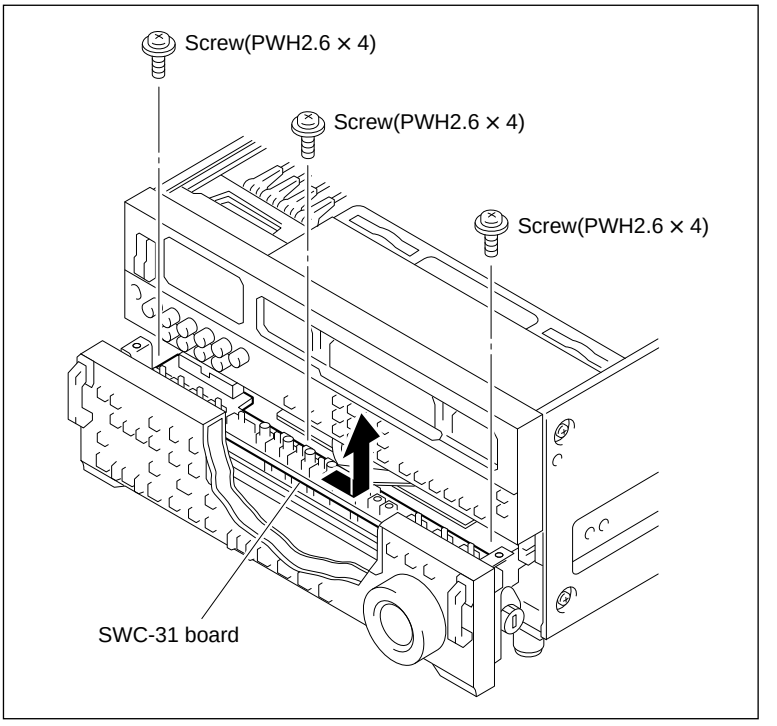
3-30-13. SWC-31 Board

Replacement

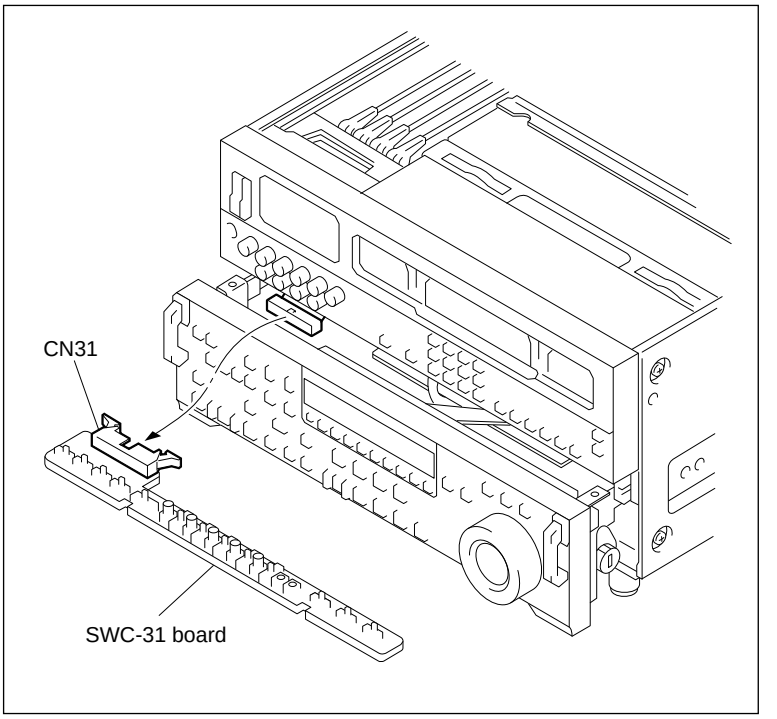
1. Turn off the power.
2. Pull out the lower control panel assembly.
3. Remove the two screws, then remove the sub control panel.



4. Remove the three screws.
5. Unlock the SWC-31 board by sliding it in the direction of the arrow, then remove the board.



6. Disconnect the flat cable from the connector (CN31).
   Then remove the SWC-31 board.



7. Install the SWC-31 board in the reverse order of steps 2 through 6.

Note

Adjustment after replacement is not required.

Note

Perform the system phase adjustment of this unit again according to the maintenance manual of the analog switcher when this unit is used in combination with an analog switcher

.

System phase adjustment

The system phase of this unit is adjusted by using the SYNC control and SC control of SYSTEM PHASE on the sub control panel.

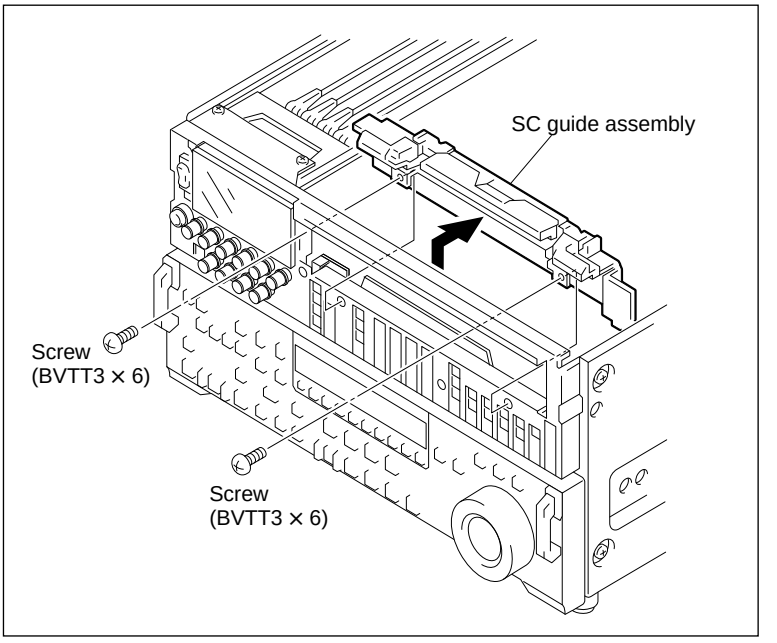
Notes

- Be sure to adjust in PB mode.
  The system phase does not change even if the SYNC/SC control is turned in the REC mode, but it changes when the REC mode is shifted to the PB mode.
- The playback sound may be momentarily in terrupted when the SYNC/SC control is turned during tape playback.

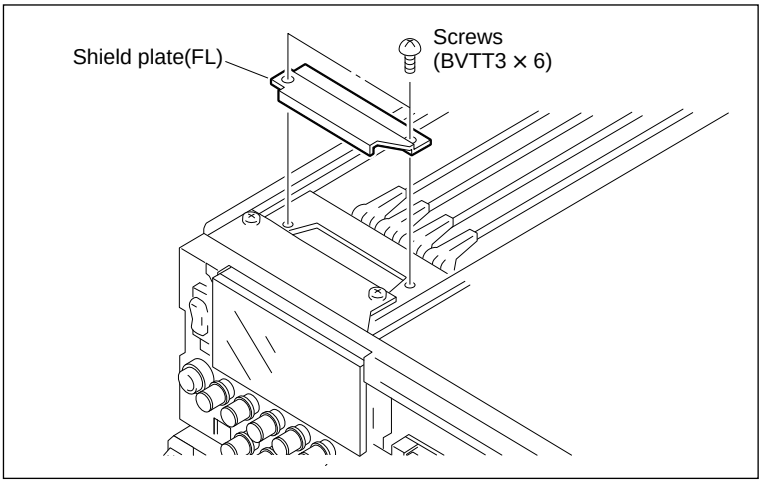
3-30-14. SWC-35 Board

Replacement

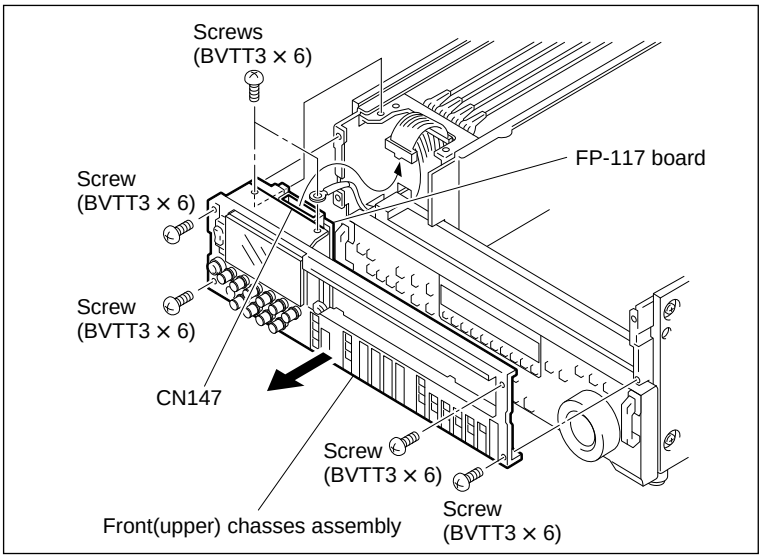
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the two screws, then remove the SC guide assembly.



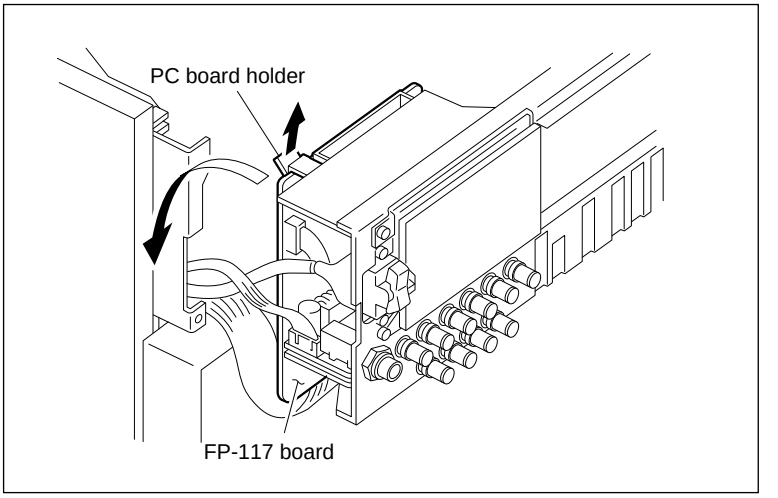
7. Remove the two screws, then remove the shield plate (FL).



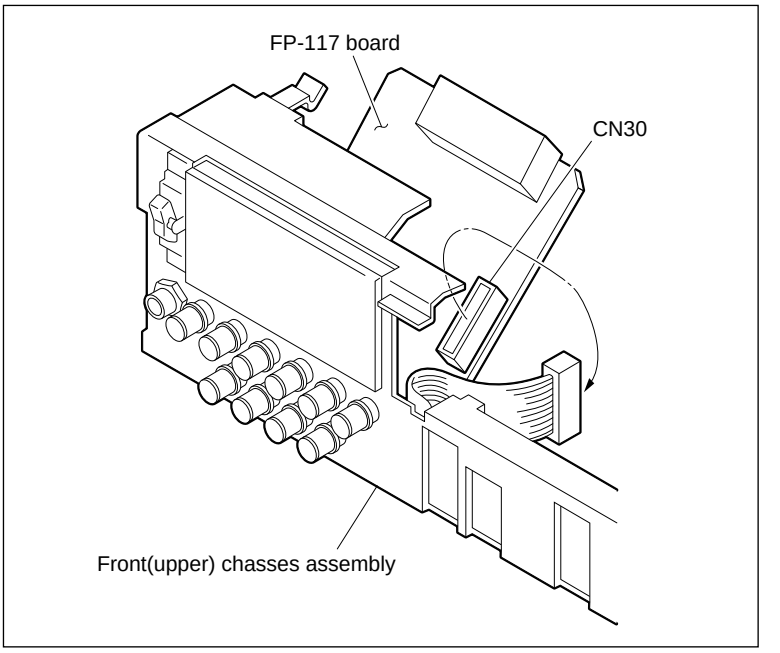
8. Disconnect the flat cable from the connector CN147 on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



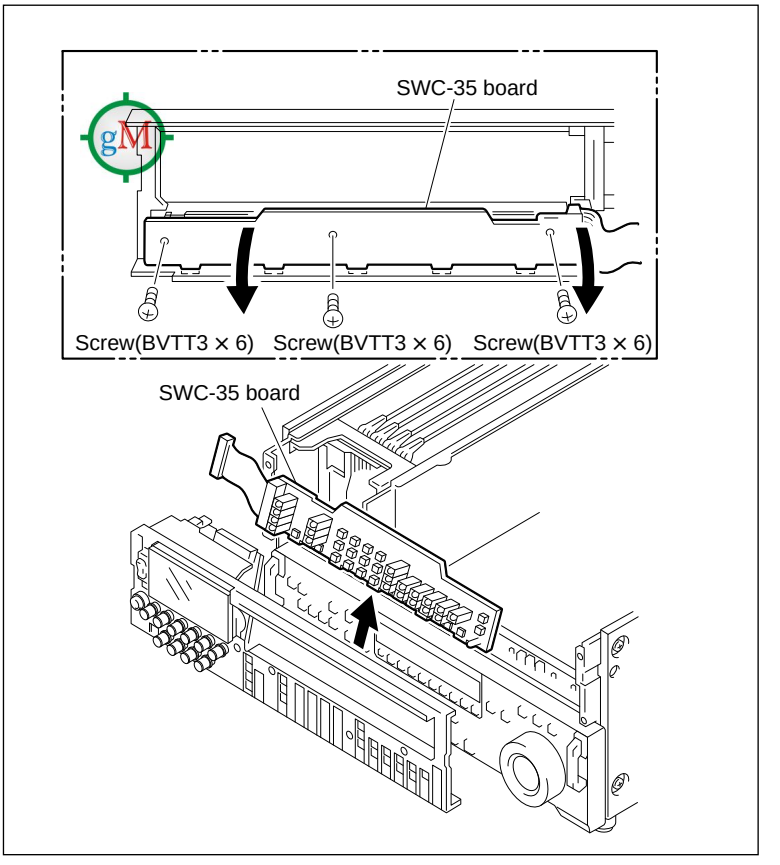
10. Undo the PC board holder, then open the FP-117 board.



11. Disconnect the flat cable from with the connector (CN30) on the FP-117 board.



12. Remove the three screws, then remove the SWC-35 board by lift up the board after inclining to rear.



13. Install the SWC-35 board in the reverse order of steps 2 through 12.

Note

Adjustment after replacement is not required.

3-30-15. TC-102 Board

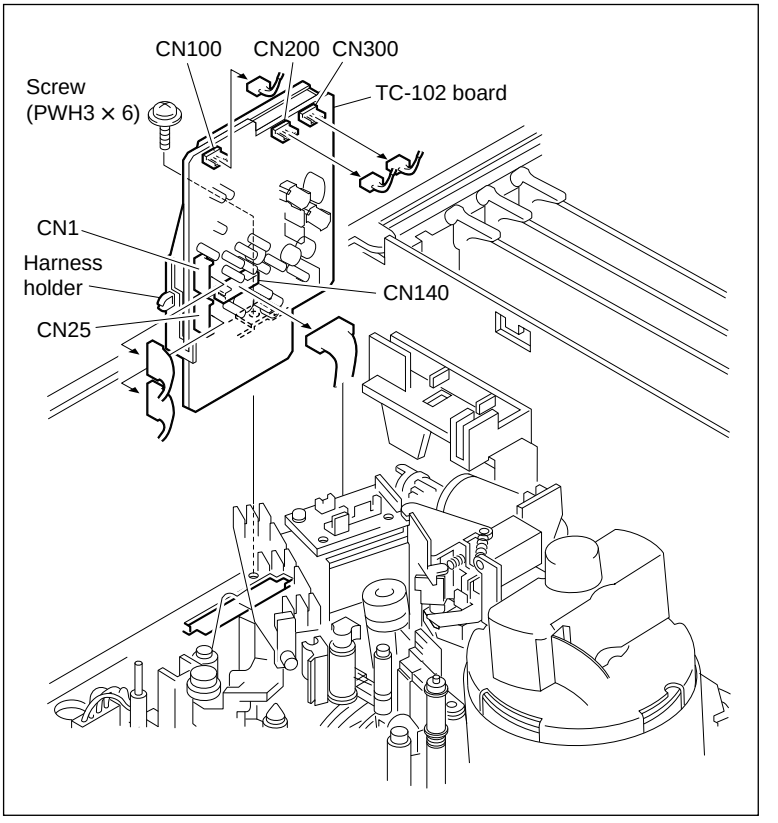
Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the screw as shown in the figure.

   Note

   Pay attention not to fall the screw upon the mechanical deck.

5. Lifting the TC-102 board, and disconnect the harnesses from the connectors (CN100, CN200, CN300, CN1, CN25 and CN140) on the TC-102 board.
   Disconnect the CN1 harness from the harness holder.
   Then remove the TC-102 board.



6. Install the TC-102 board in the reverse order of steps 2 through 5.

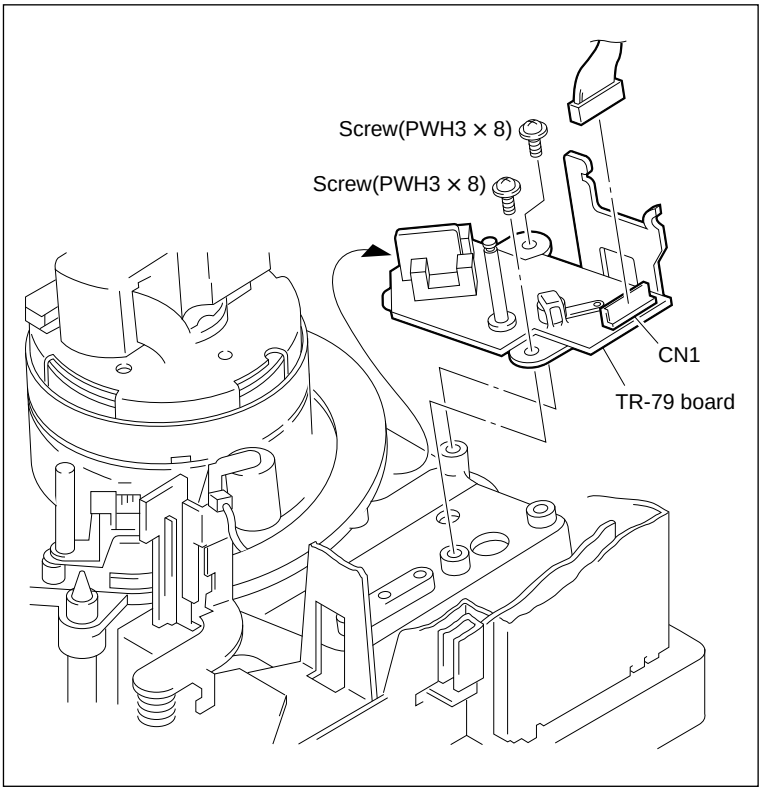
Adjustment after Replacement

7. Perform the time code system adjustment or confirmation.
   (Refer to Section 2-13.)

3-30-16. TR-79 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the T tension arm assembly.
   (Refer to Section 3-24.)
5. Disconnect the harness from the connector (CN1) on the TR-79 board.
6. Remove the two screws, then remove the TR-79 board.



7. Install the TR-79 board in the reverse order of steps 2 through 6.

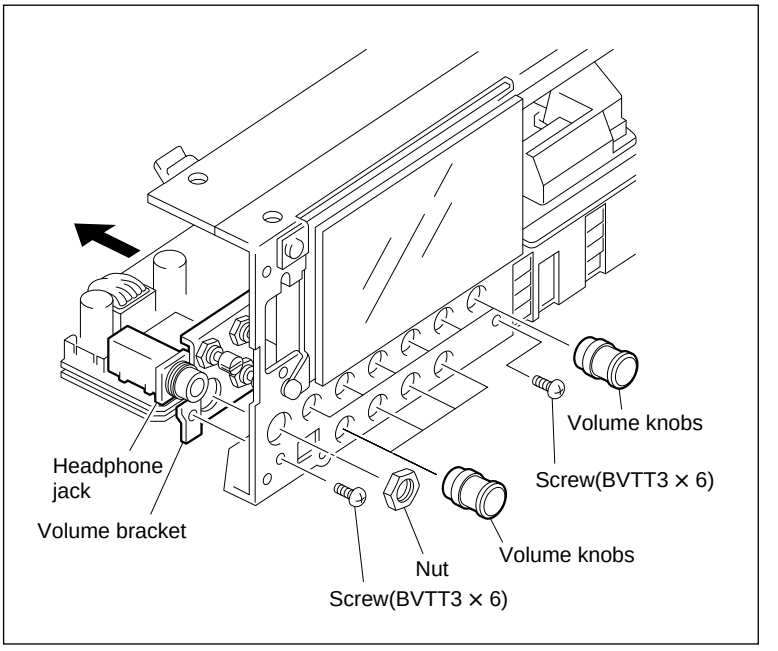
Adjustment after replacement

8. Perform the tension offset adjustment.
   Refer to Section 4-2 of the maintenance manual part1.
   (A008: S/T TENSION OFFSET)

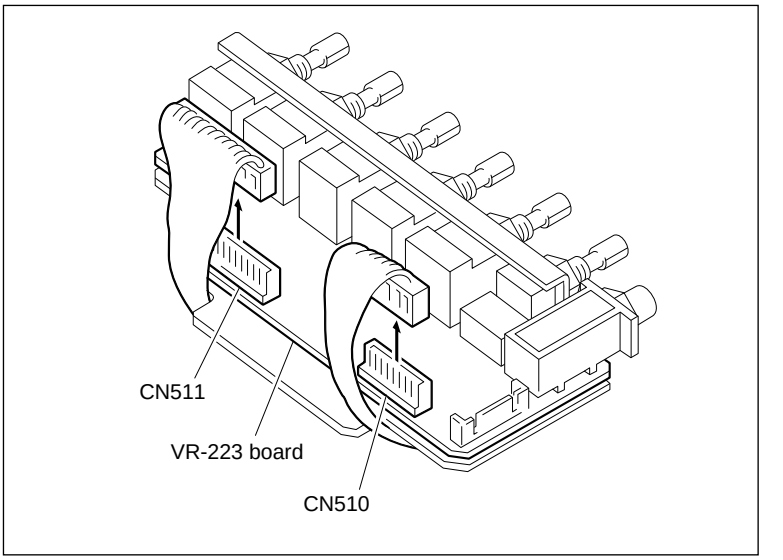
3-30-17. VR-223 Board

Replacement

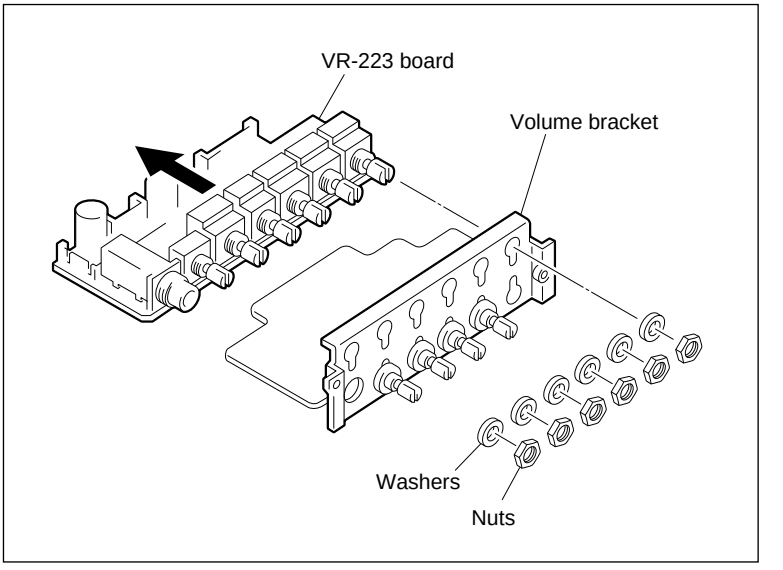
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the hernesses from the connectors (CN510 and CN511).



11. Remove the six nuts and washers, and remove the VR-223 board.



12. Install the VR-223 board in the reverse order of steps 2 through 11.

Notes

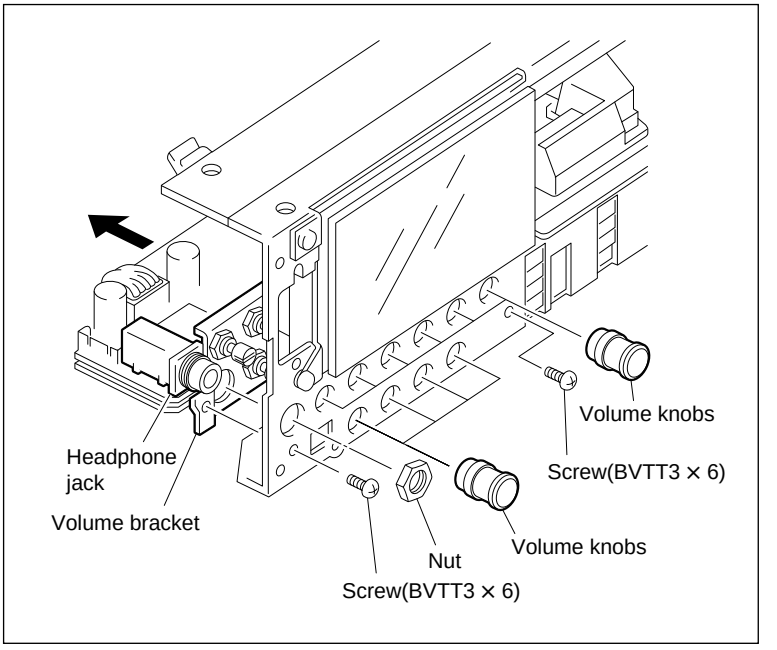
- After installing the nuts, apply locking compound.
- Adjustment after replacement is not required.

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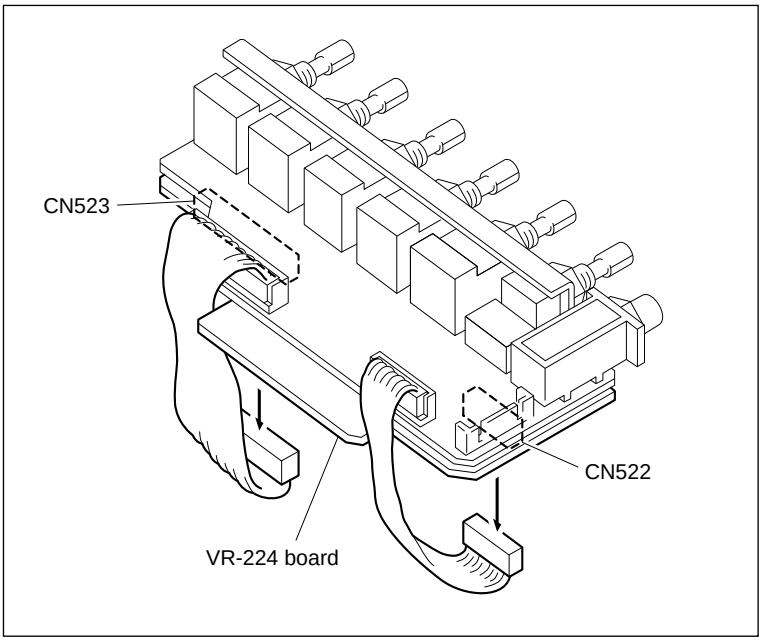
3-30-18. VR-224 Board

Replacement

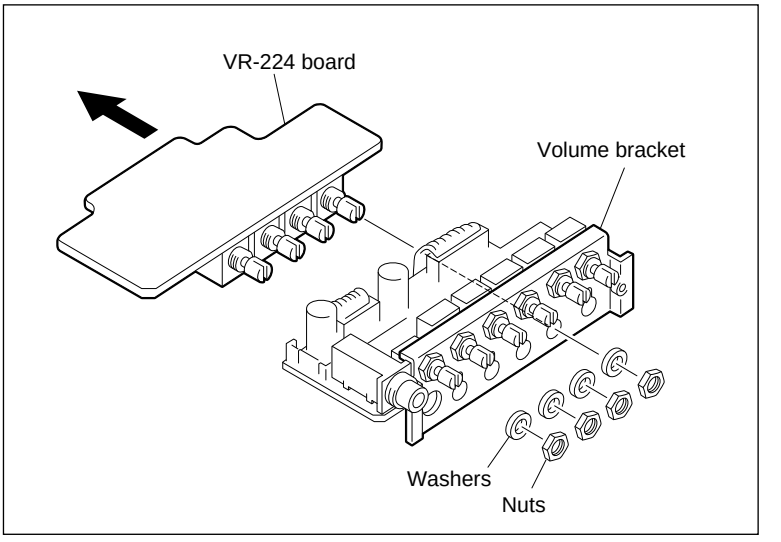
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the harnesses from the connectors (CN522 and CN523).



11. Remove the four nuts and washers, and remove the VR-224 board.



12. Install the VR-224 board in the reverse order of steps 2 through 11.

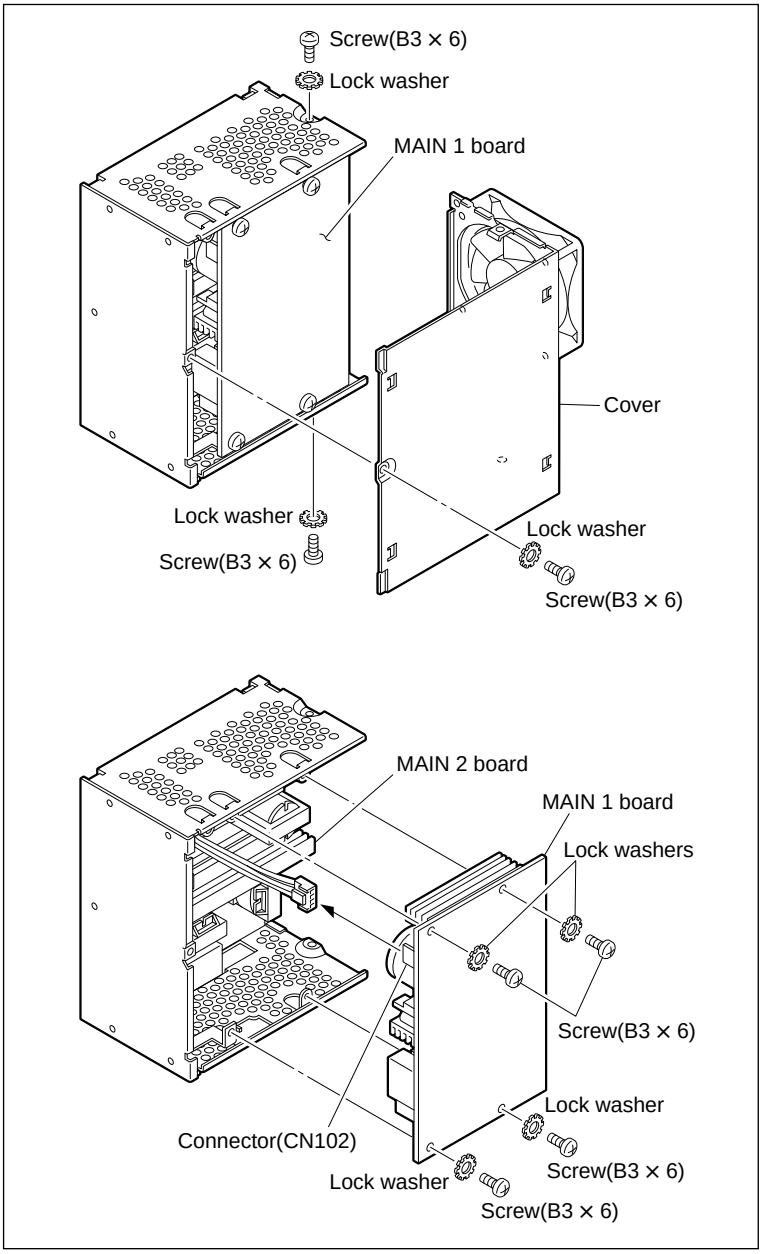
Notes

- After installing the nuts, apply locking compound.
- Adjustment after replacement is not required.

3-31. Board Replacement in Power Supply Unit

Replacement of MAIN 1 board

1. Turn off the power and wait for more than 30 seconds.
2. Remove the power supply unit. (Refer to Section 3-29.)
3. Remove the three screws and lock washers, and then remove the cover.
4. Remove the four screws and lock washers.
5. Disconnect the harness from connector (CN102) and remove the MAIN 1 board.



6. Install the MAIN 1 board in the reverse order of steps 2 to 5.

Note

Replace the whole power supply unit when replacing the MAIN 2 board.

Adjustment after replacement

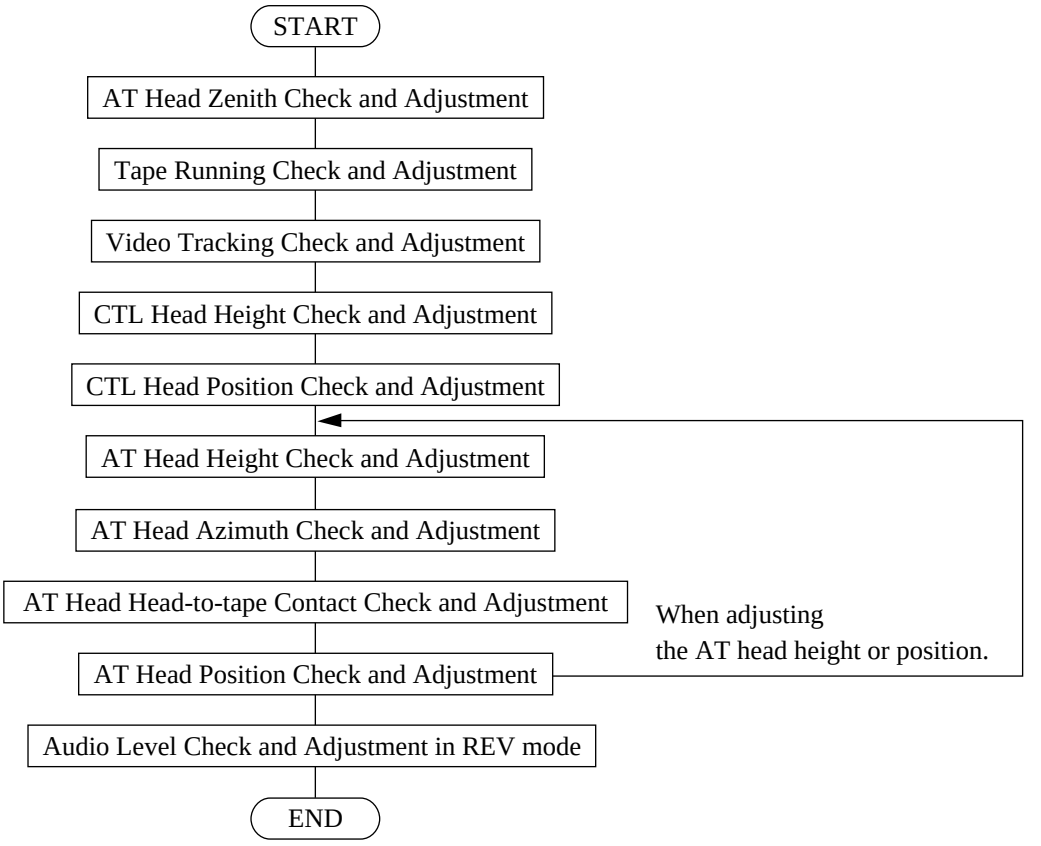
7. Perform the output voltage adjustment. (Refer to Section 2-2-2.)

Section 4
Tape Path Alignment

4-1. Tape Path Adjustment

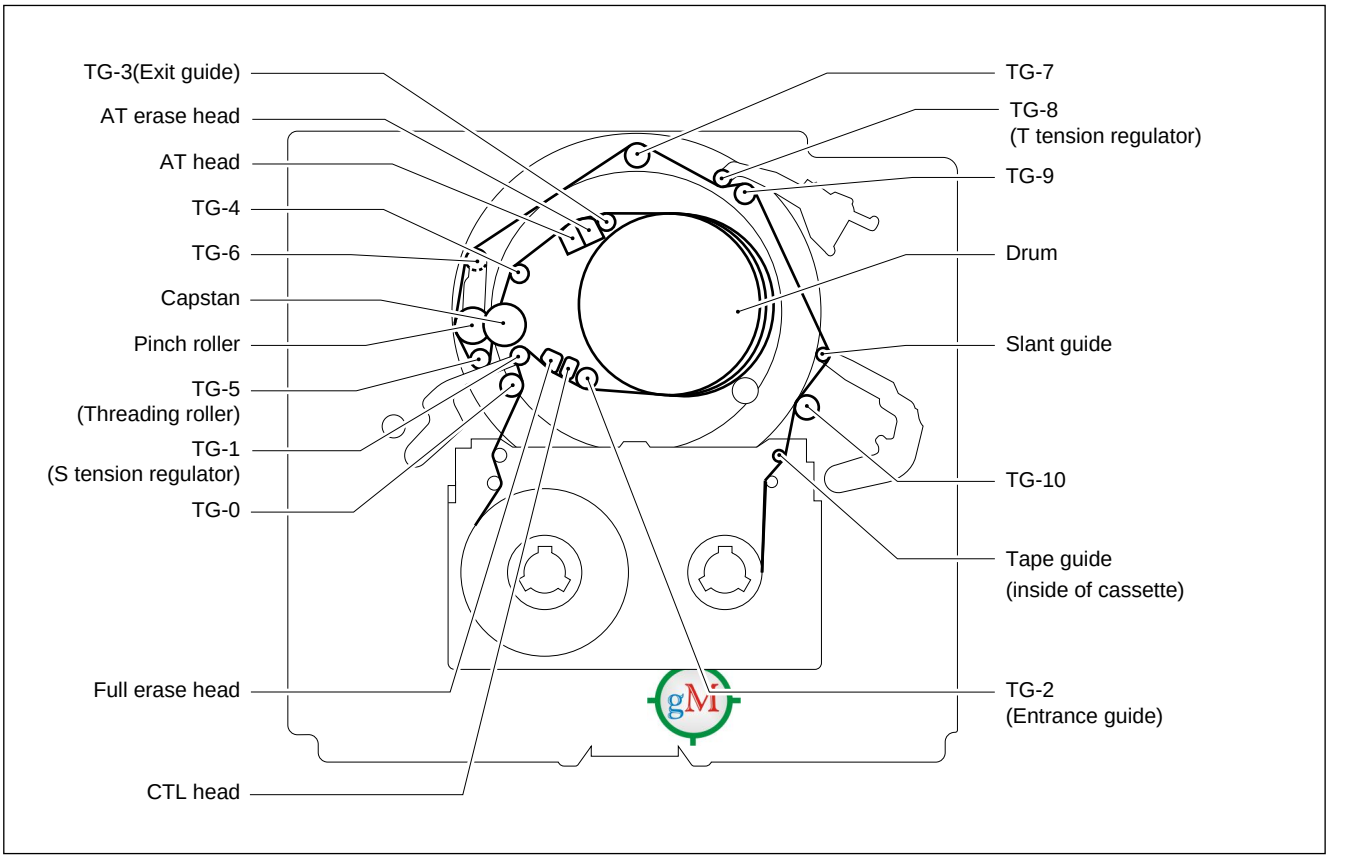
This section describes the checking and adjusting methods of the tape path system such as position, height, and slantness of tape guides and stationary heads.

1. Tape Path Adjustment Flow Chart


START
AT Head Zenith Check and Adjustment
Tape Running Check and Adjustment
Video Tracking Check and Adjustment
CTL Head Height Check and Adjustment
CTL Head Position Check and Adjustment
AT Head Height Check and Adjustment
AT Head Azimuth Check and Adjustment
AT Head Head-to-tape Contact Check and Adjustment
AT Head Position Check and Adjustment
When adjusting
the AT head height or position.
Audio Level Check and Adjustment in REV mode
END

2. Parts Location of the Tape Running System

Following figure describes the names of each part of the tape running system.
It is illustrated in the threading end mode. “ TG ” in the figure means the tape guide.



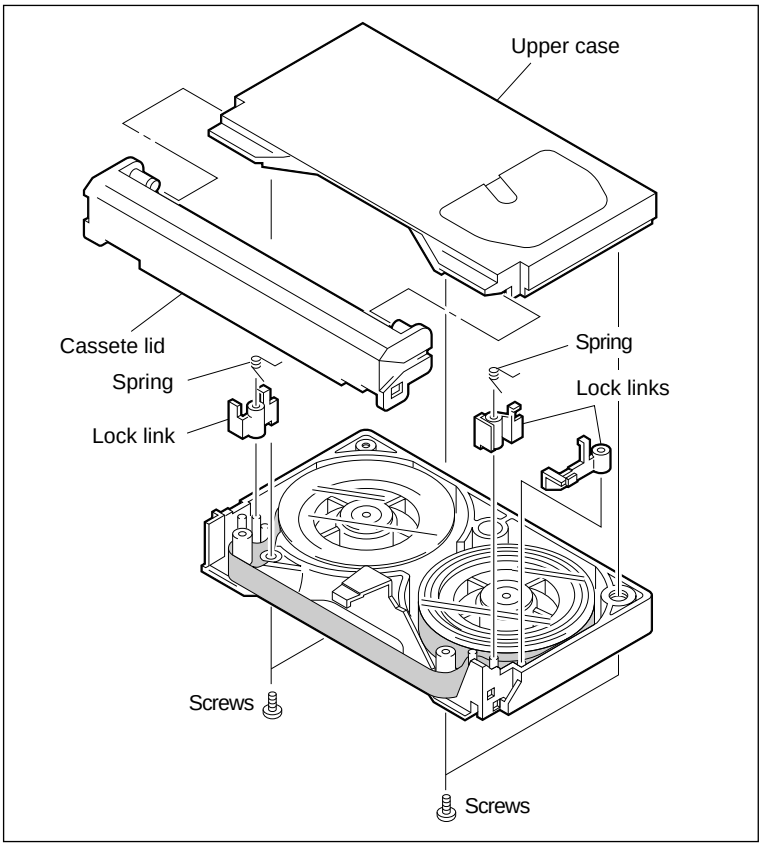
3. Cassette Compartment

- The tape path adjustment should be performed under the state that the cassette compertment is removed. If not, some checks and adjustments may be impossible.
- When the tape path adjustment is performed with the cassette compartment removed, the tape protection circuit is activated and the “ERROR” message may be displayed. In this case, turn the power off, then turn it on again.

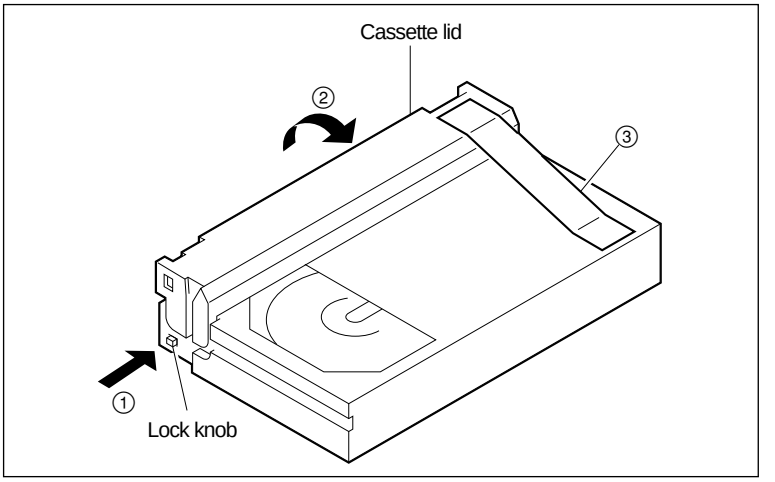
4. Cassette Tape

The tape path adjustment is performed after the cassette compertment removal.
Then, it is necessary to make a modification to the cassette tape and alignment tape that are used for tape path adjustment as follows.

(1) Cassette tape without lid
Disassembly the cassette tape, and take off the cassette lid, lock links and springs shown in the figure.



(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①) and fix the cassette lid using an adhesive tape (③).



When setting the cassette tape or the alignment tape on the VTR, put it to the cassette supports on the mechanical deck. And then, put a weight on the cassette so that it does not rise up. The weight about 1000 g is suitable.

5. Tracking Control

The method of the tracking control in the playing back mode is described below.
(1) Set a cassette tape and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.
(2) Push the PLAY button, then the tape is played back.
(3) Push S100 switch on the SS-83 board more than 1 sec..
In this state, RV100 variable resistor on the SS-83 board becomes the tracking control volume (and the LED D112 lights).
When the EJECT button is pushed or S100 switch on the SS-83 board is pushed more than 1 sec. after adjustment, the tracking control is fixed.

6. Preparation

(1) Remove the cassette compartment.
(Refer to Section 2-5 of the maintenance manual part 1.)
(2) Remove the video head cleaner.
(Refer to Section 3-5.)

Note

If the video head cleaner is installed, the tape running condition may be difficult to check. Therefore, remove the video head cleaner assembly before checking.

(3) Clean the following portions :
- Tape running surface of upper drum and heads
(Refer to Section 5-2-3 of the maintenance manual part 1.)
- Lower drum's tape running surface and lead surface
(Refer to Section 5-2-4 of the maintenance manual part 1.)
- Stationary heads (Refer to Section 5-2-5 of the maintenance manual part 1.)
- Tape running system and tape cleaner
(Refer to Section 5-2-6 of the maintenance manual part 1.)

7. Alignment Tape

(1) SR2-1 (For 525/60 system) : 8-960-075-11
SR2-1P (For 625/50 system) : 8-960-075-61

- Contents:

Time min. sec.	CTL track	AUX track	Video/Audio track	Use
00 : 00 ⇧ (PULSE) ⇩ 15 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	3.212 MHz (A CH only)	• Video Tracking Adjustment • CTL Head Position Adjustment • AT Head Height Adjustment (for camcorder) • AT Head Position Adjustment
20 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	A CH: 3.212 MHz B CH: 6.424 MHz	
25 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	12.848 MHz (ALL CH)	
27 : 00	CTL	————	100 % Color Bars	• Drum PG Phase Automatic Adjustment

* CTL head height adjustment can be performed at any portion of this alignment tape.
* When the pulse portion (00:00 to 15:00) is played back, the displayed TC data is interpolated by CTL signal due to no recording on the time code track.

(2) CR2-1B (For DNW-A75) : 8-960-096-01
CR2-1B PS (For DNW-A75P) : 8-960-096-51

- Contents:

Time min. sec.	Video track	AFM	TC	Use
00 : 00 28 : 00	Y : 4 MHz C : 5 MHz	————	7 : 3 pulse	• Video Tracking Check (Betacam/Betacam SP) • Y/C Head Head-to-Tape Contact Check

* The displayed TC data is interpolated by CTL signal due to the duty 7 : 3 pulse is recoded on the time code track.

(3) CR8-1A (For DNW-A75) : 8-960-097-45
CR8-1A PS (For DNW-A75P) : 8-960-098-45

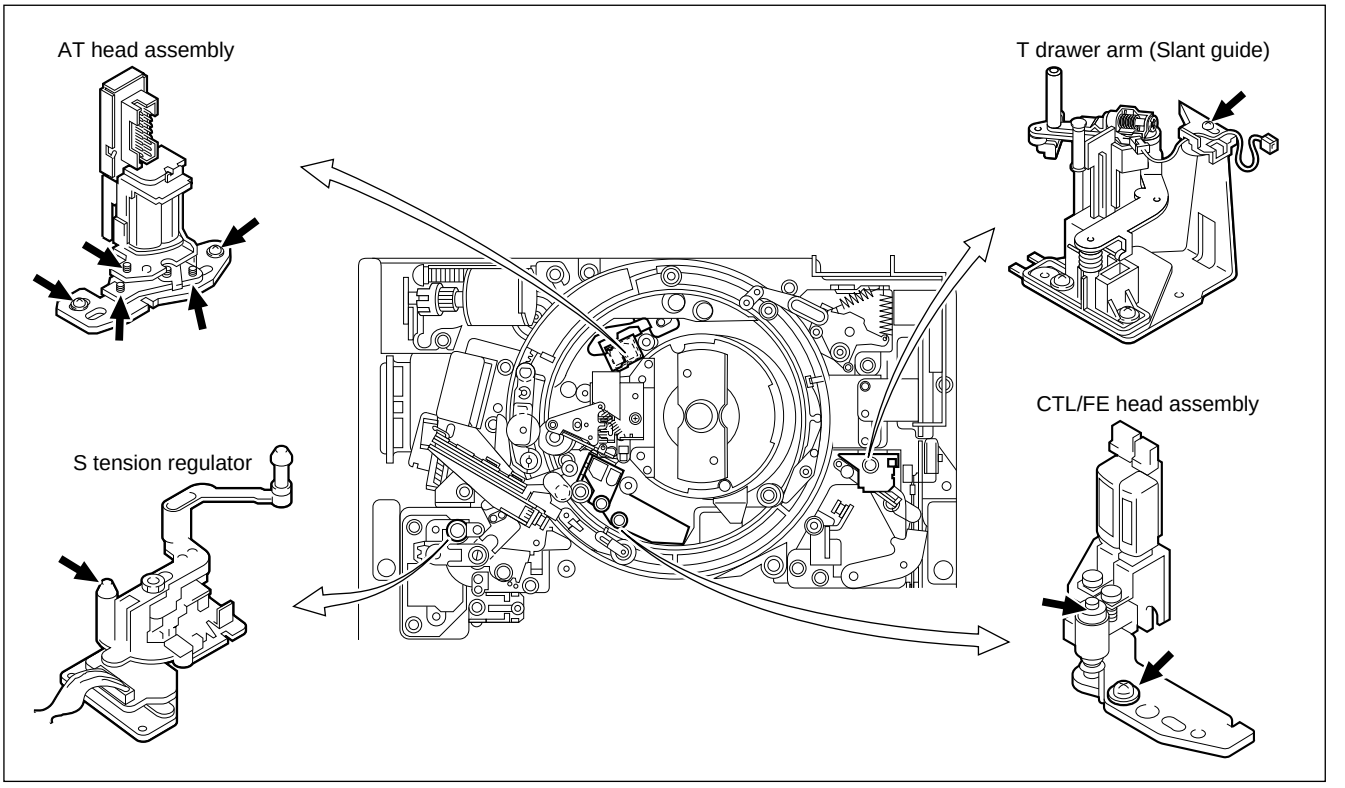
• Contents:

Time min. sec.	Audio track	Video track	CTL track	Use
00 : 00	1 kHz, 0 VU	————	CTL	
02 : 55	Blank			
03: 00	10 kHz, –10 VU	————	CTL	• AT Head Azimuth Adjustment • AT Head Head-to-tape Contact Adjustment
04 : 55	Blank			
05 : 00	1 kHz, –20 VU	————	CTL	
05 : 55	Blank			
06 : 00	40 Hz, –20 VU 7 kHz, –20 VU 10 kHz, –20 VU 15 kHz, –20 VU	————	CTL	
07 : 55	Blank			
08 : 00	1 kHz, 0 VU	————	1 kHz, 0 VU Sine Wave	• AT Head Height Adjustment • Audio Level Check in REV Mode
10 : 00				

8. Locking Compound

When loosening the following screws, apply locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off with gauze or soft cloth.

• Locking compound : 7-432-114-11



4-1-1. AT Head Zenith Check and Adjustment

Note

The AT head zenith check and adjustment are required only when the AT head is replaced.

Tools

- Flatness plate (SL-657): J-6086-570-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Check

1. Unthreading End Mode

Check that the unit is in the unthreading end mode.

2. Check the AT Head Zenith

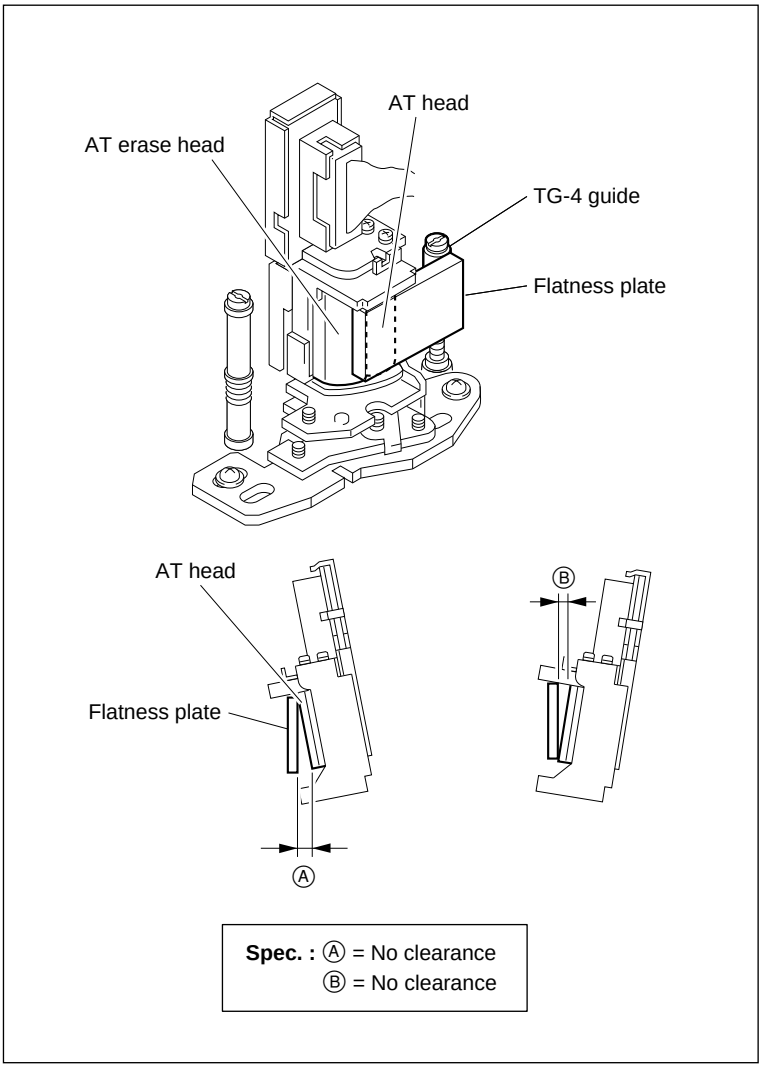
(1) Place the flatness plate lightly against the TG-4 guide and AT head.

Note

Be careful not to damage the surface of the AT head and TG-4 guide.

(2) Check that no clearance exists between the AT head and flatness plate as TG-4 guide reference in step (1).

If the specification is not satisfied, perform steps 3 and later.
If it is satisfied, perform step 7.



AT Head Zenith Check

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Adjustment

3. Remove the CL Guide Rail

Remove the two screws, then remove the CL guide rail.

4. In Case of Clearance Exists at the Upper Part (Fig. 1)

Turn the zenith adjustment screw counterclockwise to satisfy the specification.

5. In Case of Clearance Exists at the Lower Part (Fig. 2)

Turn the zenith adjustment screw clockwise to satisfy the specification.

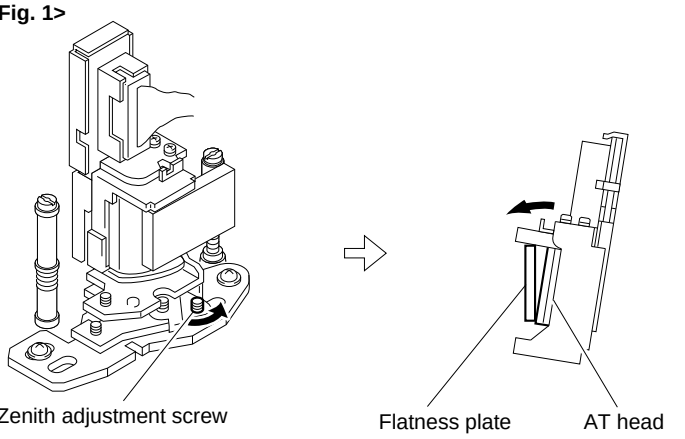
6. Install the CL Guide Rail

Install the CL guide rail with two screws.

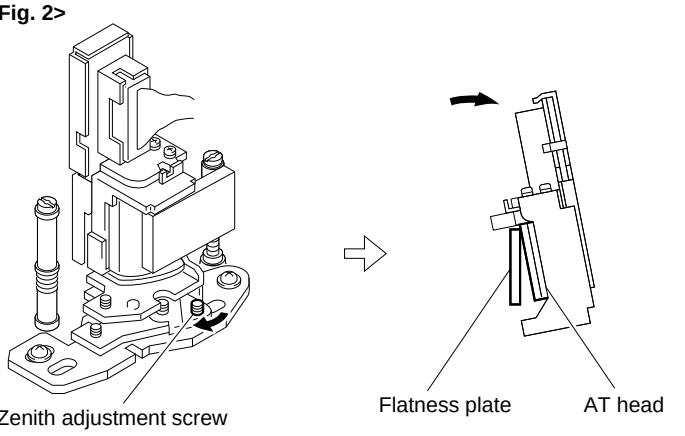
7. Cleaning

Clean the surface of the AT head, AT erase head, and TG-4 guide with a cleaning cloth moistened with cleaning fluid.

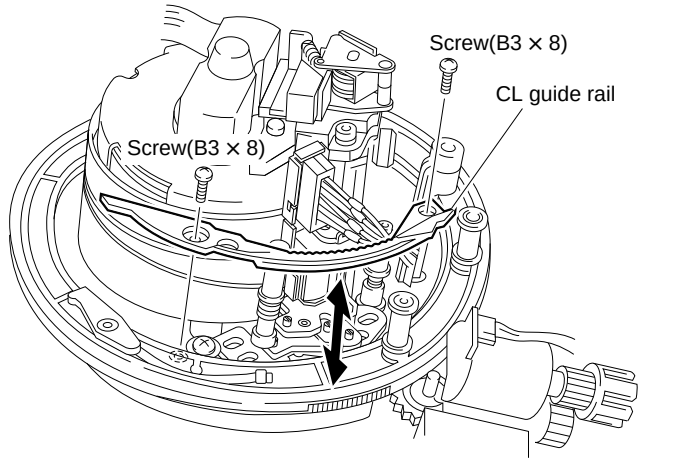
<Fig. 1>



<Fig. 2>



・**Removal/Installation of the CL Guide Rail**



AT Head Zenith Adjustment

4-1-2. Tape Running Check and Adjustment

Note

The tape running is closely related to the height of the S and T reel tables. Check the height of the S and T reel tables before this tape running check and adjustment. (Refer to Section 3-15-4.)

Tape Entrance Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the RS table block assembly in the S cassette position. (Refer to Section 3-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

4. REV × 10 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

5. F. FWD Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

6. REW Mode

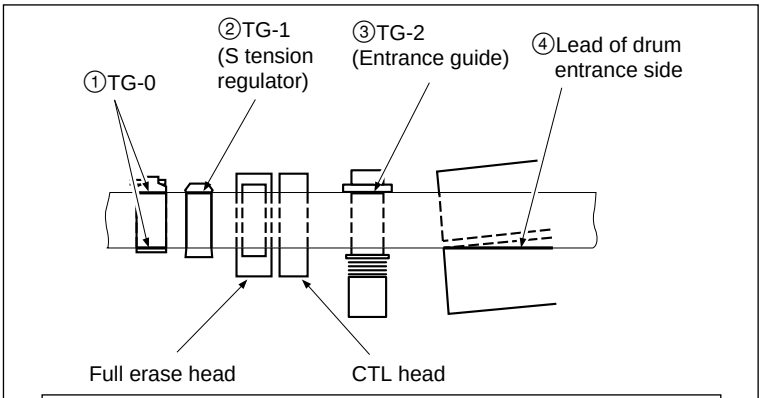
Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

7. REV × 1 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

8. VAR × –1/30 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.



Spec.1 : ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tape Running Check at Tape Entrance Side

Adjustment

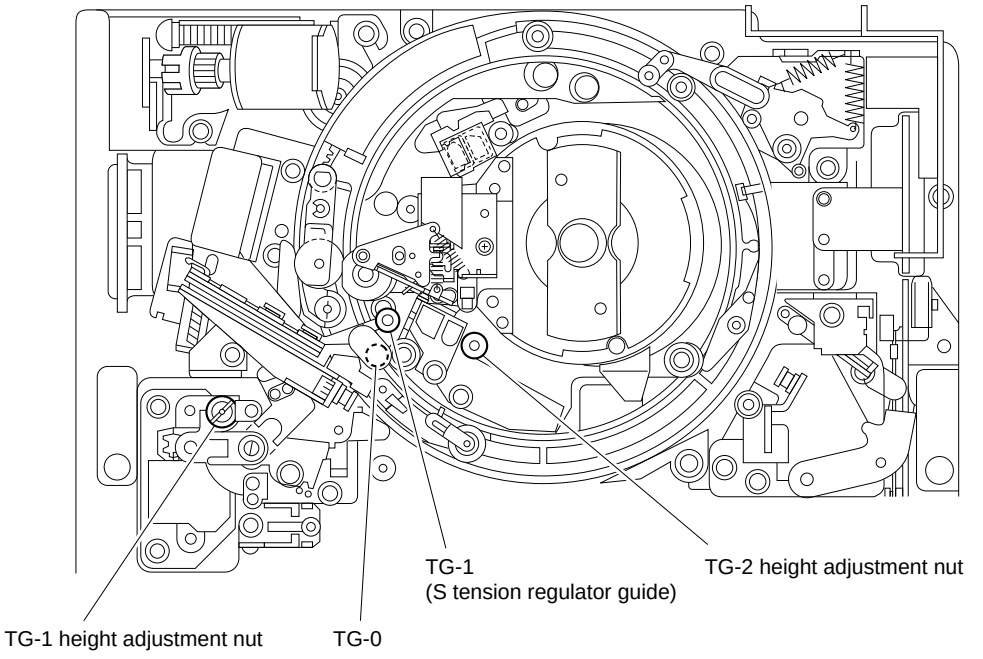
9. Adjust the TG-1 and TG-2 Height

(1) Put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-1 and TG-2 using a tape guide adjustment driver and adjust the height of TG-1 and TG-2 so that the specification 1 is satisfied.

10. Recheck the Tape Running at Tape Entrance Side

Perform the tape running check refer to steps 3 through 8, and perform the video tracking adjustment (Refer to Section 4-1-3).

If the specification 1 is not satisfied, perform the adjustment in step 9 again.



Tape Running Adjustment at Tape Entrance Side

Tape Exit Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Betacam cassette (L cassette) : BCT-90MLA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the reel tables in the S cassette position. (Refer to Section 3-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

4. REV × 10 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

5 F. FWD Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

6. REW Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

7. REV × 1 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

8. VAR × –1/30 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

9. Set the L Cassette Tape

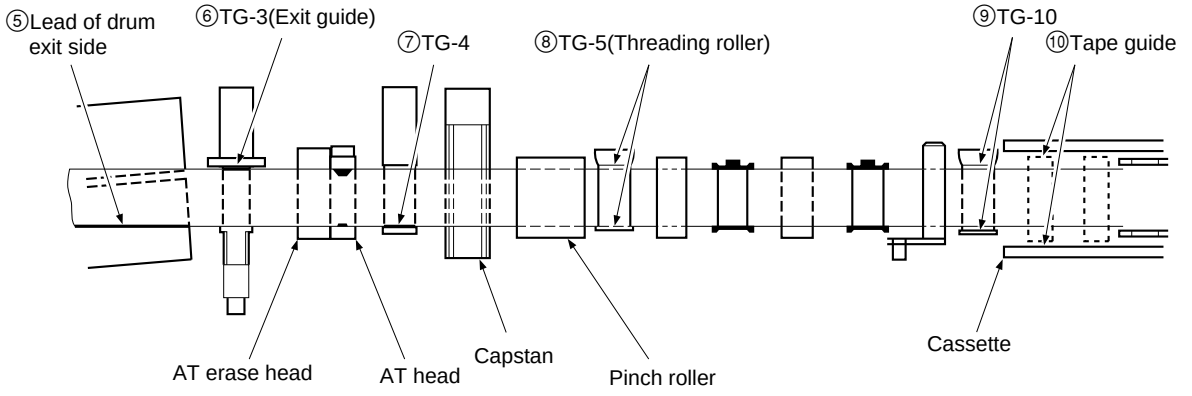
(1) Remove the S cassette.
(2) Press S100 switch (D-1/side A) on the SS-83 board and place the reel tables in the L cassette position.
(3) Set the L cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

10. Play Back the Tape

Play back the tape beginning portion of the L cassette.

11. Check the Tape Running at the T Tape Guide of Cassette and TG-10.

Check that the tape running condition satisfies specification 3 at TG-10 and the T tape guide of the L cassette.
If specification 3 is not satisfied, perform step 15.



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Spec.3 : Play mode
⑨ TG-10
The tape runs not in contact with the upper and lower flanges.

⑩ Take-up side tape guide of cassette
The tape runs without any curl at the upper and lower portions of the tape guide.

Tape Running Check at Tape Exit Side

Adjustment

12. Adjust the TG-3 (Exit Guide) and TG-4 Height

(1) Set the S cassette and put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-3 and TG-4 using a tape guide adjustment driver and adjust the height of TG-3 and TG-4 so that the specification 2 is satisfied.
(3) Perform the video tracking adjustment (Refer to Section 4-1-3).

13. Adjust the TG-5 (Threading Roller) Height (only when the specification is not satisfied in REV × 10 mode and VAR × –1/30 mode)

(1) Push the EJECT button.
(2) Remove the cassette tape.
(3) Turn the upper flange of TG-5 using a tape guide adjustment driver and adjust the height of TG-5 so that the specification 2 is satisfied.
(4) Set the S cassette tape and put the unit into the REV × 10 mode or VAR × −1/30 mode. At this time, check that the tape running condition satisfies specification 2.

    If it is not satisfied, repeat steps (1) through (4) mentioned above.

14. Recheck the Tape Running at Tape Exit Side

Perform steps 2 through 8 again.

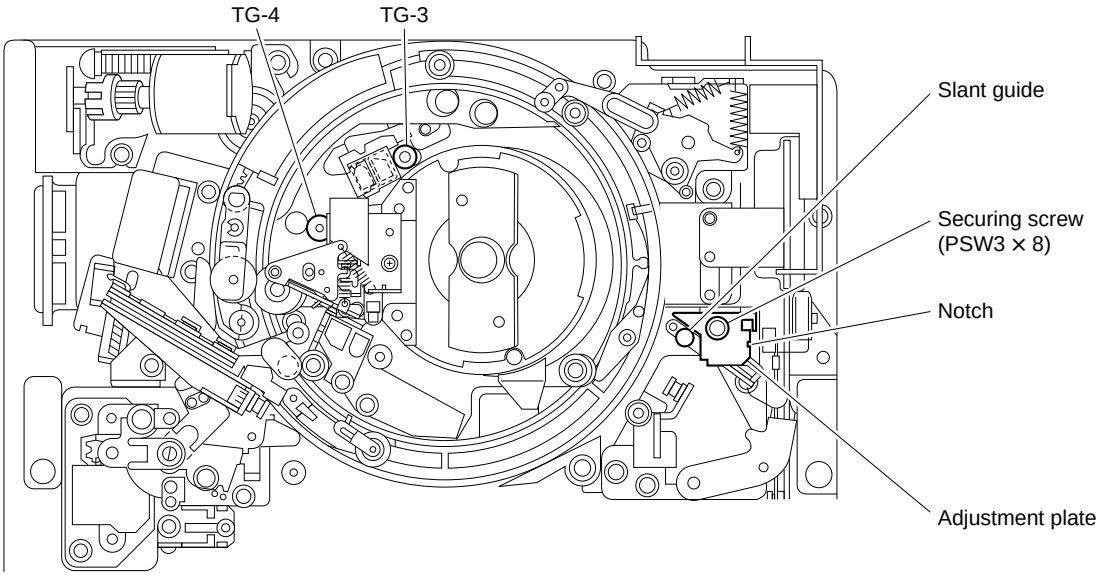
If the specification 2 is not satisfied, perform the adjustment in step 12 again.
(If the specification 2 is not satisfied in REV × 10 mode or VAR ×−1/30 mode, perform the adjustment in step 13 again.)

15. Adjust the Slant Guide Slantness

(1) Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.
(2) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(3) Turn the screwdriver to adjust the slantness of the slant guide so that specification 3 is satisfied.
(4) Tighten the screw loosened in step (1).
(5) Recheck that specification 3 is satisfied referring to steps 9 through 11.

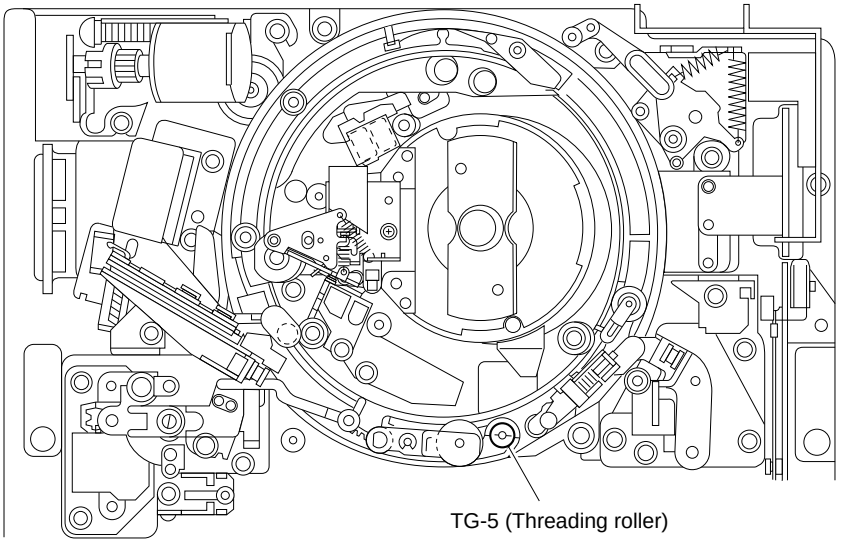
    If it is not satisfied, repeat steps (1) through (5) mentioned above.

・TG-3 and TG-4 height adjustment/slant guide slantness adjustment



・TG-5 Height adjustment (Only when the specification is not satisfied in REV × 10 mode or VAR × –1/30 mode)

<Unthreading end mode>



Tape Running Adjustment at Tape Exit Side

4-1-3. Video Tracking Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Alignment tape CR2-1B (For DNW-A75): 8-960-096-01
- Alignment tape CR2-1B PS (For DNW-A75P): 8-960-096-51
- Recording tape: Betacam SX Tape (BCT-SX series)
- Oscilloscope (Tektronix 2465B or equivalent)
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP100/EQ-75 board (A1A5 SEL signal)
TRIG: TP325/SS-83 board (SS GOP signal)

Oscilloscope setting:
CH-1: 200 mV/DIV
CH-2: 5 V/DIV
TIME: 2 ms/DIV

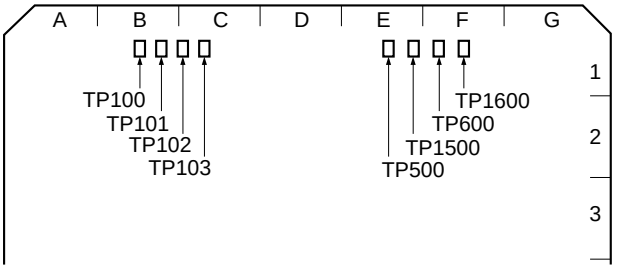
3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

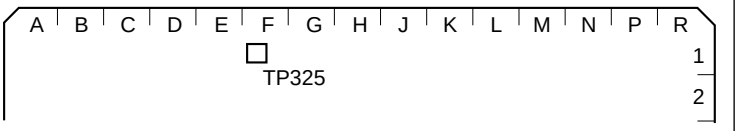
- Connection of the oscilloscope

CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP100/EQ-75 board (A1A5 SEL signal)
TRIG: TP325/SS-83 board (SS GOP signal)

<EQ-75 board, side A>



<SS-83 board, side A>



Preparation

Check

4. Turn the Power On

5. Check the PB Head Head-to-tape Contact

(1) Play back the SR2-1/P (20:00 to 25:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
The waveform is displayed on the oscilloscope as shown in the figure.
(3) Turn the tracking VR so that the output level of the center portion of RF waveform of A1 channel is maximized.
(4) Check that RF waveform of A1 channel satisfies the spec.1 in a state of procedure (3).
(5) Maximize the output level of RF waveform of A5 channel, check that RF waveform of A5 channel satisfies the spec.1.
(6) Change the connections of CH-1 and CH-2 of the oscilloscope as follows, and perform the check from procedures (1) through (5) in the same way.

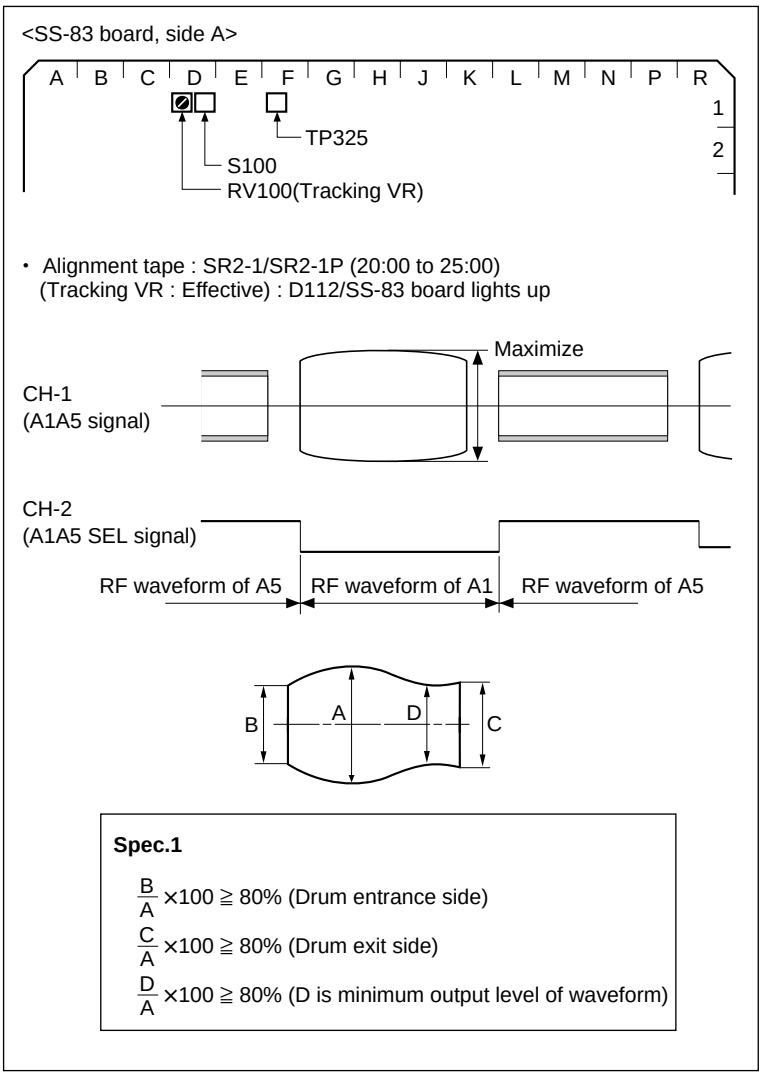
- CH-1: TP500, CH-2: TP100
- CH-1: TP600, CH-2: TP102
- CH-1: TP1500, CH-2: TP100
- CH-1: TP1600, CH-2: TP102

(All of these TPs are on the EQ-75 board.)

Note

The signal that is output from each TP is as shown below.

TP100 (A1A5 SEL signal)
TP102 (A2A6 SEL signal)
TP500 (A1A5 signal)
TP600 (A2A6 signal)
TP1500 (B1B5 signal)
TP1600 (B2B6 signal)



PB Head Head -to-tape Contact Check

6. Check the Y/C Head Head-to-tape Contact

(1) Connect the oscilloscope.
CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP1500/EQ-75 board (B1B5 signal)
TRIG: TP100/EQ-75 board (A1A5 SEL signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 to 2 ms/DIV

Note

The Ya and Yb signals of Betacam/Betacam SP are output from TP500 under playing back the CR2-1B/PS. In the same way, the Ca and Cb signals are output from TP1500.

(2) Press the EJECT button so that the unit put into the unthreading end state and remove the SR2-1/P.
At the same time, the tracking VR becomes to be not effective.
LED: Check that D112/SS-83 board lights out.

(3) Set the CR2-1B/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

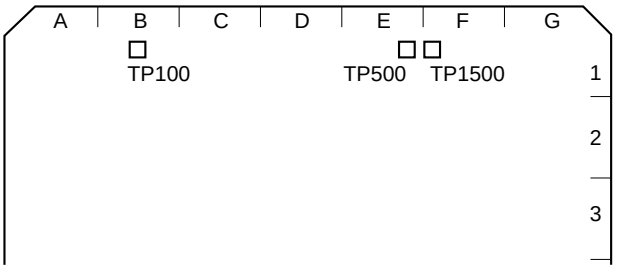
(4) Press the PLAY button to play back the CR2-1B/PS. (Any portion playback is acceptable)
The waveform is displayed on the oscilloscope as shown in the figure.

(5) Check that the RF waveform of Ya, Yb and the RF waveform of Ca, Cb satisfy the specification 2.

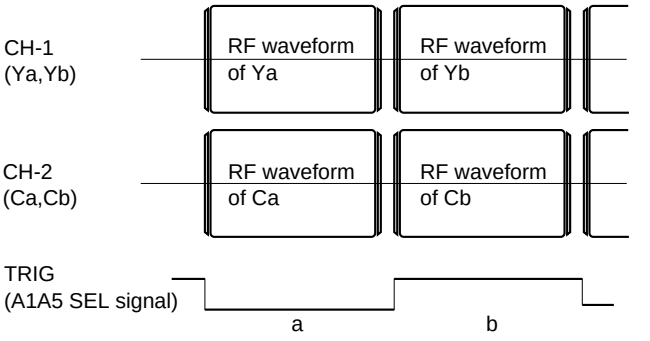
- Connection of the oscilloscope

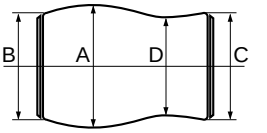
CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP1500/EQ-75 board (B1B5 signal)
TRIG: TP100/EQ-75 board (A1A5 SEL signal)

<EQ-75 board, side A>



- Alignment tape : CR2-1B/CR2-1B PS (Any portion)
(Tracking VR : Not effective) : D112/SS-83 board lights out





Spec.2

$\frac{B}{A} \times 100 \geqq 80\%$ (Drum entrance side)

$\frac{C}{A} \times 100 \geqq 80\%$ (Drum exit side)

$\frac{D}{A} \times 100 \geqq 80\%$ (D is minimum output level of waveform)

Y/C Head Head-to-tape Contact Check

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7. CONFI Head Output Check

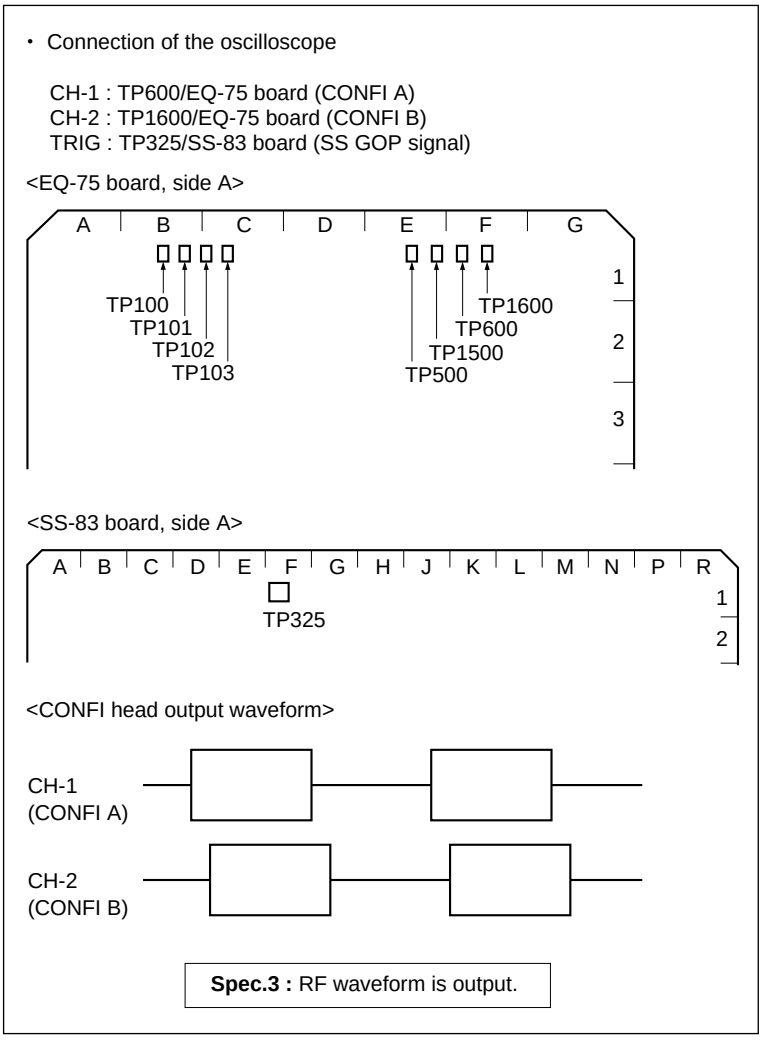
(1) Connect the oscilloscope.
CH-1: TP600/EQ-75 board (CONFI A)
CH-2: TP1600/EQ-75 board (CONFI B)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting
CH-1: 20 mV/DIV
CH-2: 20 mV/DIV
TRIG: 5 V/DIV
TIME: 5 ms

(2) Press the EJECT button so that the unit put into the unthreading end state and remove the CR2-1B/PS.

(3) Set the recording SX tape and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

(4) Put the unit into the REC mode.

(5) Check that RF waveforms are output from CH-1 and CH-2 while is recording to the tape. (Spec. 3)



CONFI Head Output Check

8. Mode Setting (Rec Head PB)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.

(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.

(3) Set the cursor to the "A4: MECHANISM ADJUST" and press the SET button.

(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.

(5) Check that the "Switching PB" is indicated, and press the SET button.
Then, □ mark is indicated at the right up corner on the monitor.

Note

Refer to Section 4 of Maintenance Manual Part 1 "Maintenance Mode" for more information about the maintenance mode.

9. PLAY Mode

(1) Connect the oscilloscope.
CH-1: TP106/SS-83 board
(AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting:
CH-1: 200 mV/DIV
TRIG: 5 V/DIV
TIME: 1 ms/DIV

(2) Play back the SR2-1/P (00:00 to 15:00).

(3) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112/SS-83 board lights up.

(4) Turn the tracking VR so that the output level of RF envelope waveform is maximized.

(5) Turn RV100 on the SS-83 board clockwise so that the center portion of the RF envelope waveform makes 80% of the maximum output level.

(6) At the state of (5), check that the RF envelope waveform satisfies specification 4.

Note

If the level fluctuates, read the average level.

(7) If the level fluctuates, turn RV100 on the SS-83 board so that the output level in the center portion of the RF envelope waveform is maximum, and check that the fluctuation amounts satisfy specification 5.

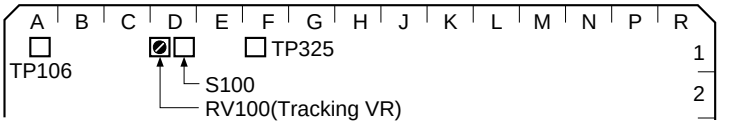
If specifications 4 and 5 are not satisfied, perform the adjustment (at the Tape Entrance Side or the Tape Exit Side) in steps 12 and later.

– Continued on the next page. –

• Connection of the oscilloscope

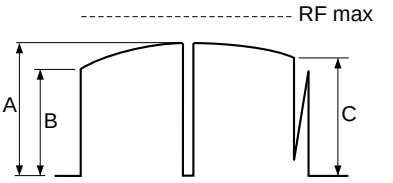
CH-1 : TP106/SS-83 board (AB EVEN ENV signal)
TRIG : TP325/SS-83 board (SS GOP signal)

<SS-83 board, side A>



• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Head-to-tape contact>



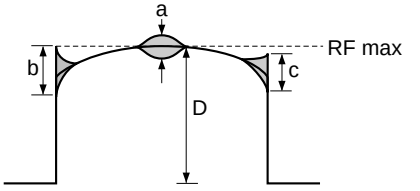
A = RF max × 0.8

Spec.4 : $\frac{B}{A} \times 100 \geqq 70\%$

$\frac{C}{A} \times 100 \geqq 70\%$

(Output levels (B and C) at the tape entrance side and exit side are more than 70% of the center level(A).)

<Fluctuation>



D = Average maximum level at waveform center

Spec.5 : $\frac{a}{D} \times 100 \leqq 20\%$

$\frac{b}{D} \times 100 \leqq 20\%$

$\frac{c}{D} \times 100 \leqq 20\%$

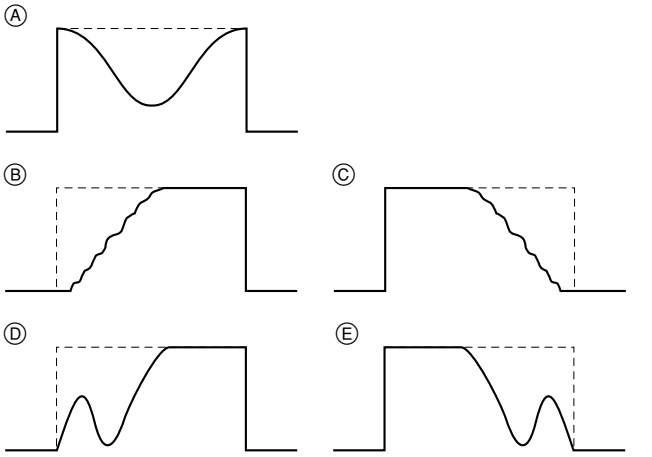
(Fluctuation amounts (a, b, c) at the drum center portion, entrance side and exit side are less than 20% of the average maximum level (D).)

If the output waveform is extremely abnormal condition as shown in Fig.1 after replacing the upper drum assembly, perform the upper drum replacement again.

- Upper drum assembly replacement (Refer to Section 3-2.)

<Fig. 1>

- Abnormal waveform (For example)



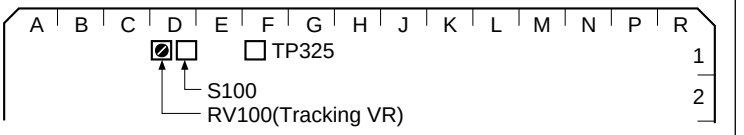
Video Tracking Check (PLAY)

10. F. FWD and REW Mode

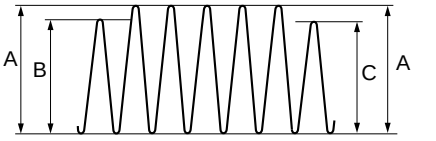
(1) Press the PLAY button and play back the SR2-1/P (00:00 to 15:00).
(2) Put the unit into the F. FWD mode and check that the RF waveform satisfies specifications 6 and 7.
(3) Put the unit into the REW mode and check that the RF waveform satisfies specifications 6 and 7.

If specifications 6 and 7 are not satisfied, perform the adjustment (at the Tape Entrance Side or Tape Exit Side) in steps 12 and later.

<SS-83 board, side A>



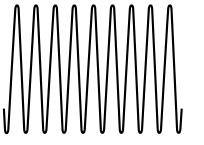
- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00) (Tracking VR : Not effective) : D112/SS-83 board lights out



Spec.6 : $\frac{B}{A} \times 100 \geqq 70\%$ (Tape entrance side)
$\frac{C}{A} \times 100 \geqq 70\%$ (Tape exit side)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00) (Tracking VR : Not effective) : D112/SS-83 board lights out

Spec.7 : No waveform lacking exists.



Video Tracking Check (F. FWD, REW)

11. REW Mode to PLAY Mode

(1) Play back the SR2-1/P (00:00 to 15:00).

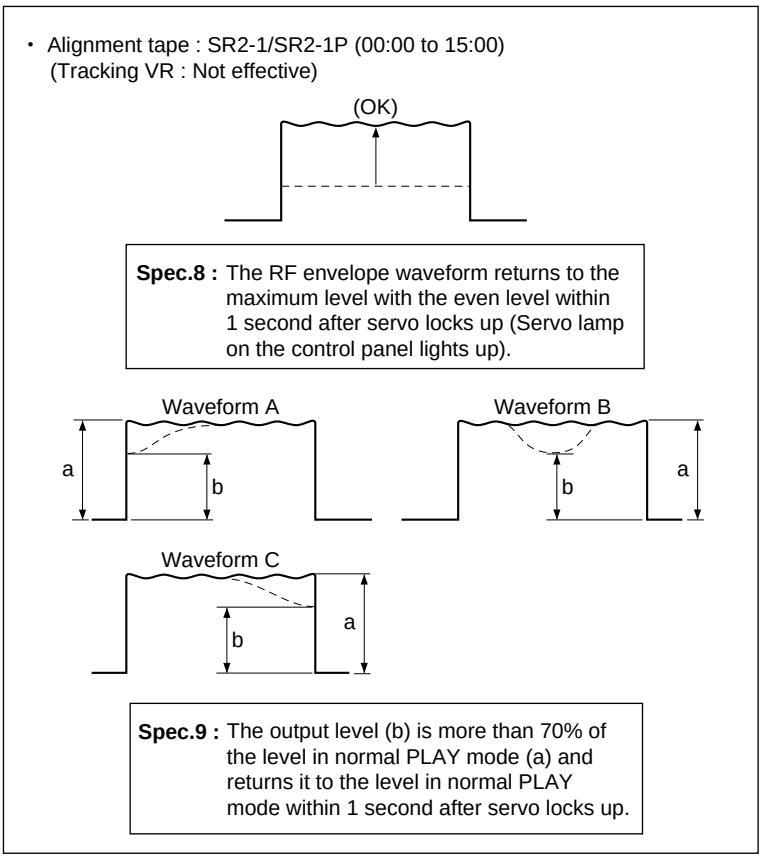
(2) Put the unit into the REW mode once. Two or three seconds later, put the unit into the PLAY mode.

Check that the RF envelope waveform satisfies the specification 8.

- In case of the waveform become A, B or C Check that the output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up (Spec. 9)

If specification 9 is not satisfied in waveform A or B shown in the figure, check the tape running at the tape entrance side. (Refer to Section 4-1-2.)

If specification 9 is not satisfied in waveform C shown in the figure, check the tape running at the tape exit side. (Refer to Section 4-1-2.)


• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Not effective)
(OK)
Spec.8 : The RF envelope waveform returns to the maximum level with the even level within 1 second after servo locks up (Servo lamp on the control panel lights up).
Waveform A
a
b
Waveform B
a
b
Waveform C
a
b
Spec.9 : The output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up.

Video Tracking Check (REW ⇨ PLAY)

Adjustment

Tape Entrance Side

12. Change the Mode Setting

(1) Press the SET button to cancel the SWITCHING PB mode.
(2) Turn the search dial while pressing the JOG button so that the "FULL PB" is indicated, and press the SET button.

Note

After that, the overlap portion appears on the RF waveform.

13. Adjust the Tracking at Tape Entrance Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform makes 80% of the maximum output level.
(4) Loosen the height adjustment nut of TG-2, and turn the upper flange so that the tape does not in contact with the upper flange of TG-2.
(5) Turn the height adjustment nut of TG-1 so that the overlap portion of the entrance side of the RF envelope waveform makes flat. (Fig. 1)

If the waveform does not make flat, perform the check described below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of Maintenance Manual Part 1.)
② Press down the tape by bamboo stick very lightly and check that the tape is running along the drum lead.

(6) Turn the height adjustment nut of TG-1 clockwise 30˚ more from the state of the step (5).

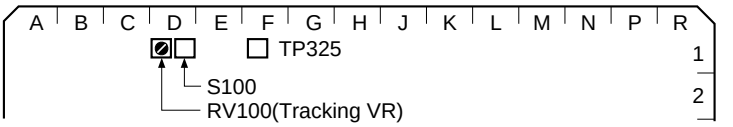
Note

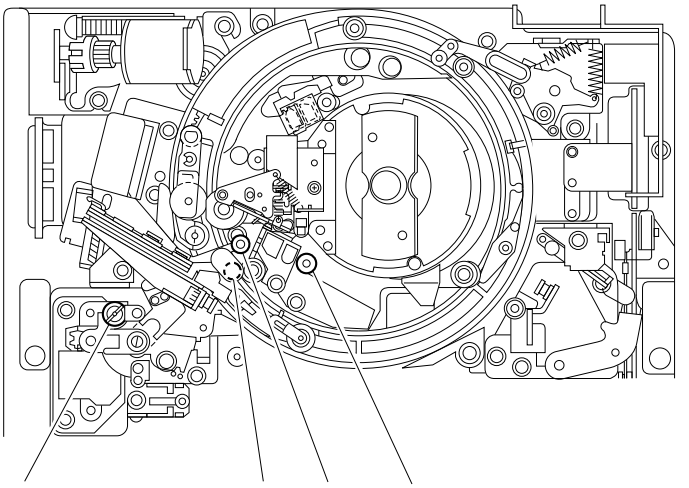
Turning the height adjustment nut causes the waveform of the overlap portion to be not flat.

(7) Turn the height adjustment nut of TG-2 to clockwise so that the upper flange contacts the tape.

– Continued on the next page. –

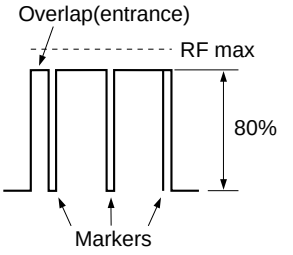
<SS-83 board, side A>

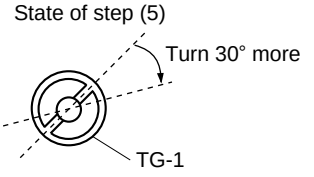




• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Fig. 1>





(8) Check that the levels A and B as shown in the figure satisfy the specification 10.

If the waveform is not satisfied the specification 10, perform the adjustment from step (1) again.

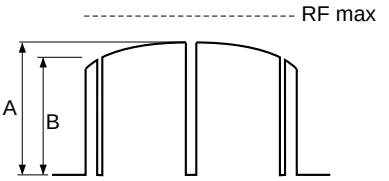
(9) Check the tape running at the tape entrance side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 11 at either TG-0, TG-1 or TG-2, perform the adjustments from the first step (1) again.

14. Recheck the Video Tracking

Perform steps 5 through 11 again.

<Fig. 2>



A = RF max × 0.8

Spec.10 : $\frac{B}{A} \times 100 \geqq 70\%$

<Tape running check at enyrance side>

Spec.11 : ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1(S Tention regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2(Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

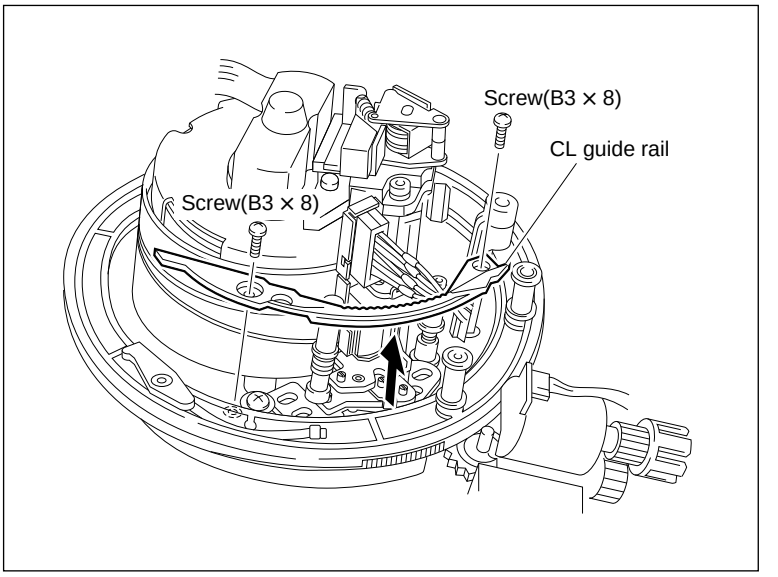
④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl rt the lead.

Tracking Adjustment at Tape Entrance Side

Tape Exit Side

15. CL Guide Rail Removal

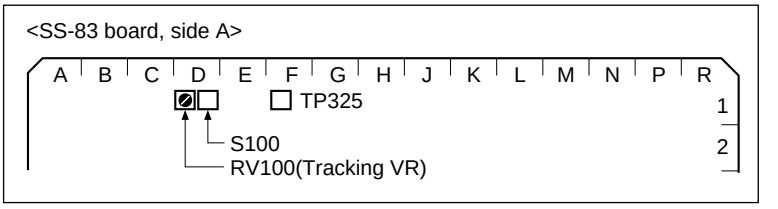
Remove the two screws, then remove the CL guide rail.



CL Guide Rail Removal

16. Tracking Adjust at Tape Exit Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform to the maximum output level.



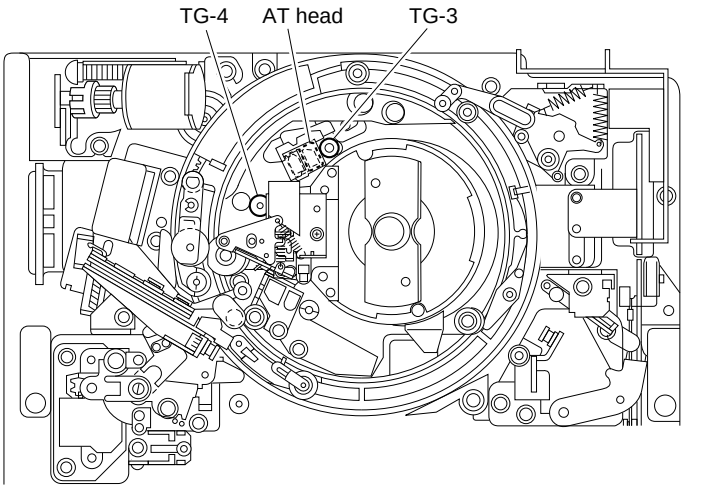
– Continued on the next page. –

(4) Turn the height adjustment nut of TG-3 counterclockwise by one to two turns so that the tape does not in contact with the upper flange of TG-3.
(5) Turn the height adjustment nut of TG-4 clockwise so that the tape does not in contact with the lower flange of TG-4.
(6) Turn the zenith adjustment screw of the AT head so that the right portion of the RF envelope waveform makes 20% or less of the maximum output level. (Fig. 1)
At this time, check that the tape does not in contact with both upper flange of TG-3 and lower flange of TG-4.
If the tape contacts either flange, repeat step (4) or (5).
If the tape moves upward or downward following the guide flange movement, perform the following adjustment.
This trouble cause is uneven tape tension at upside or downside of the tape caused by AT head zenith.
  - If the tape moves upward at TG-3:
    Turn the zenith adjustment screw counterclockwise.
  - If the tape moves downward at TG-4:
    Turn the zenith adjustment screw clockwise.

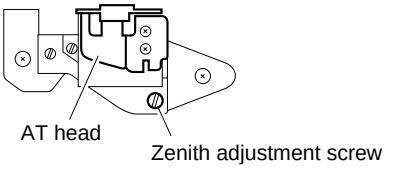
(7) Turn the height adjustment nut of TG-3 so that the tape is in contacts with the upper flange and the RF envelope waveform becomes flat. (Fig. 2)
At this time, the tape does not in contact with the lower flange of TG-4.

If the waveform does not become flat, perform the check and adjustment below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of the maintenance manual part 1.)
② Press down the tape by bamboo stick very lightly and check that the tape is running without aparting from the drum lead.
③ If the waveform does not become flat even though steps ① and ② mentioned above are performed, adjust the height of TG-3 so that the RF envelope waveform is nearly flat within the range of the specification 12 shown in the Fig.3. At this time, do not overpress the tape at TG-3.

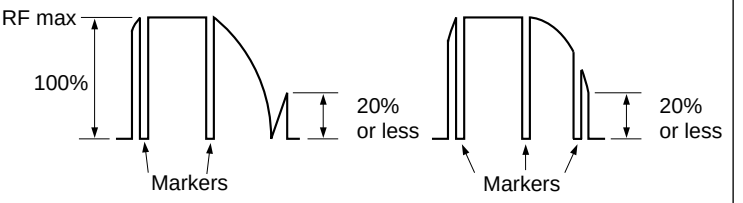


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)

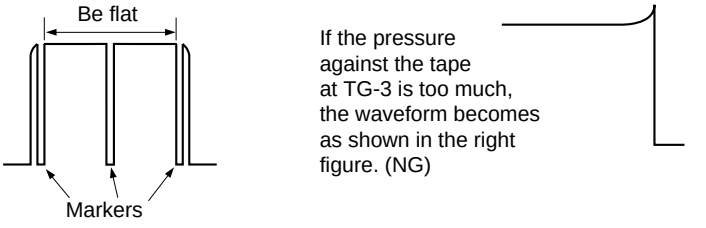


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Effective) : D112/SS-83 board lights up

<Fig. 1>



<Fig. 2>



– Continued on the next page. –

Note

When adjusting the height of TG-3 in step ③, be sure to check the height of AT head (Refer to Section 4-1-6). If the AT head height does not satisfy the specification, repeat the video tracking adjustment.

(8) Adjust the height of TG-4 so that the lower flange of TG-4 in contact with the tape.
(9) Check the tape running at the tape exit side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 13 at TG-3, perform the following adjustments while observing the waveform.

① Change the zenith of the AT head within the range of the specification shown in Fig. 1.
② Perform the tracking adjustment again. (Refer to steps (1) through (9) mentioned above.)
③ (In case of the adjustment is performed the AT head zenith)
Perform the checks and adjustments described below.
- AT head height (Refer to Section 4-1-6.)
- AT head azimuth (Refer to Section 4-1-7.)
- AT head head-to-tape contact (Refer to Section 4-1-8.)
- AT head position (Refer to Section 4-1-9.)

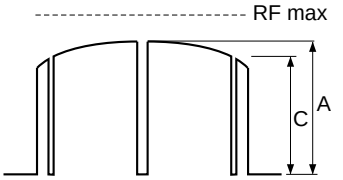
17. Recheck the Video Tracking

Perform the steps 5 through 11 again.

18. Install the CL Guide Rail

Install the CL guide rail with two screws.

<Fig. 3>



A = RF max × 0.8

Spec.12 : $\frac{C}{A} \times 100 \geqq 70\%$

<Tape running check>

Spec.13 : ⑤ Lead of drum exit side
The tape runs without any curl at the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Tracking Adjustment at Tape Exit Side

4-1-4. CTL Head Height Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

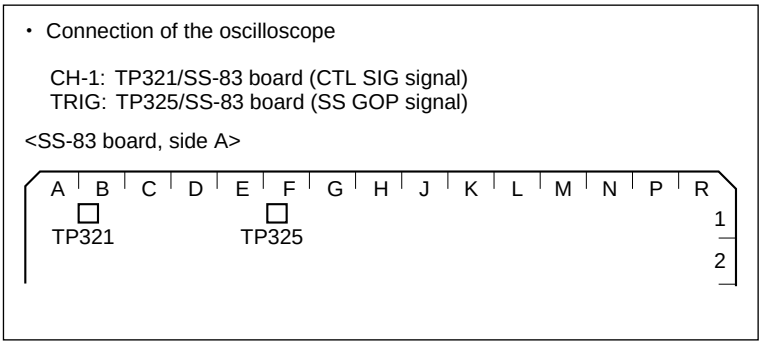
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP321/SS-83 board (CTL signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (15:00 to 27:00).

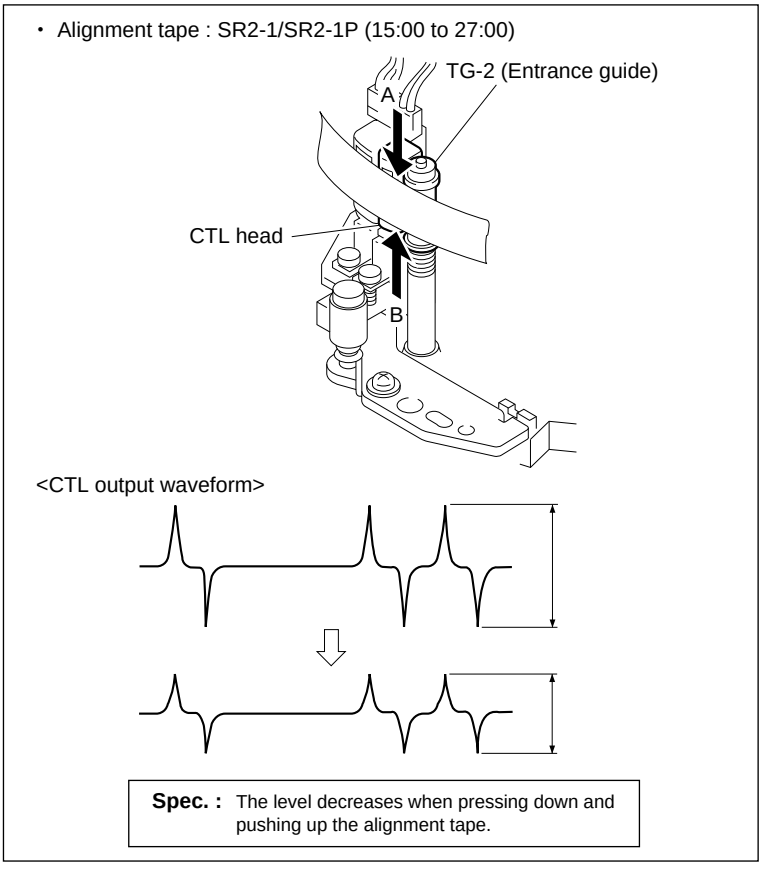
6. Check the CTL Head Height

(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 7.

(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 8.



CTL Head Height Check

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Adjustment

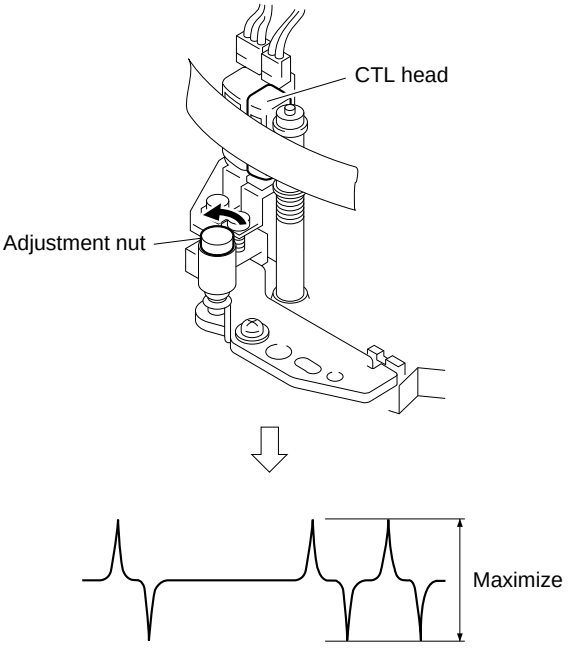
7. In Case the Level Increases when the Tape is Pressed Down (Fig. 1)

Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.

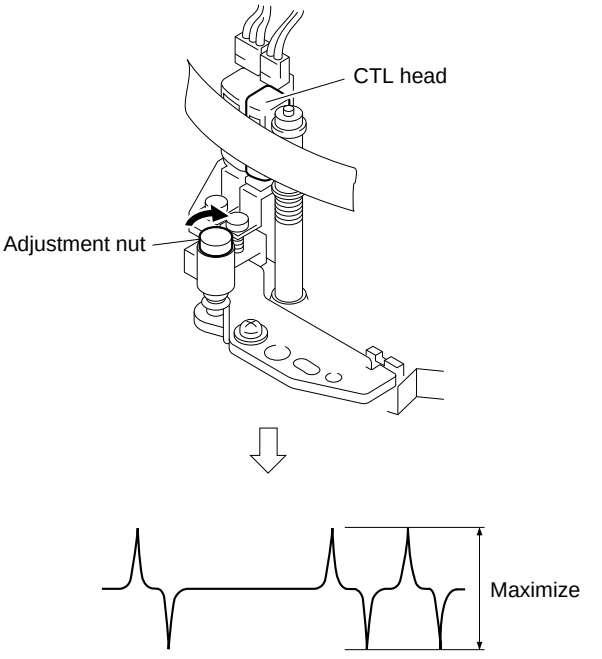
8. In Case the Level Increases when the Tape is Pushed Up (Fig. 2)

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.

<Fig. 1>



<Fig. 2>



CTL Head Height Adjustment

4-1-5. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to confirm the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

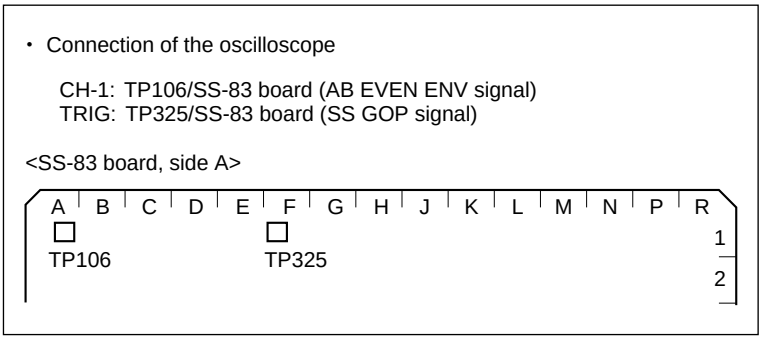
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP106/SS-83 board (AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Mode Setting (REC Head PB)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.
(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "A4 : MECHANISM ADJUST" and press the SET button.
(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.

Note

Refer to the section 4 of the maintenance manual part 1 "Maintenance Mode" for more information about the maintenance mode.

6. Play Back the Alignment Tape

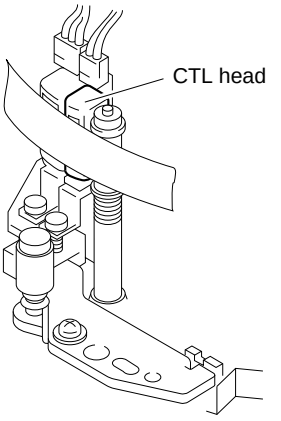
Play back the SR2-1/P (00:00 to 15:00).

7. Check the CTL Head Position

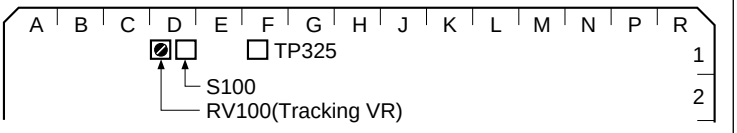
(1) Check that the marker exists in the RF waveform that comes 15 ms. later than the rising edge of the SS GOP signal.
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 (tracking VR) on the SS-83 board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.
(4) Push S100 switch on the SS-83 board more than 1 sec. to fix the tracking VR.
LED: Check that D112 lights out.
(5) Read the output level at the center portion of the RF envelope waveform as L_F.
(6) Check that the levels Lv and L_F satisfy the specification 2.

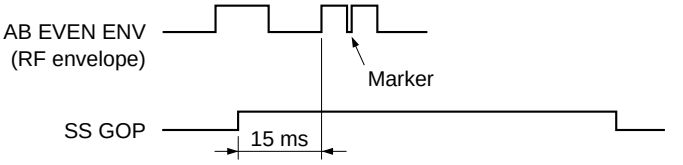
If the specification is not satisfied, perform steps 8 and later.

• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up



<SS-83 board, side A>





Spec.1 : The marker exists in the RF waveform that comes 15 ms later than the rising edge of the SS GOP signal.

(Tracking control : Effective state) (Tracking control : Non effective state)



$$\frac{L_F}{L_V} \geqq 0.8$$

Spec.2 : When the tracking VR is not effective, the output level at the center portion of the RF envelope waveform (L_F) is 80% and more against the maximum output level (L_V) under the state of the tracking is effective.

CTL Head Position Check

Adjustment

Note

Perform the adjustment described below under the state of the tracking is not effective.

8. Loosen the Screw

Loosen the securing screw of the CTL/FE head assembly by 1/4 to 1/2 turn.

9. Adjust the CTL Head Position

(1) Insert a 3 mm flatbladed screwdriver into the notch of the CTL/FE head assembly.
(2) Adjust the CTL/FE head assembly position so that the output level at the center portion is maximum and the marker exists in the RF envelope waveform that comes 15 ms later than the rising edge of the SS GOP signal.

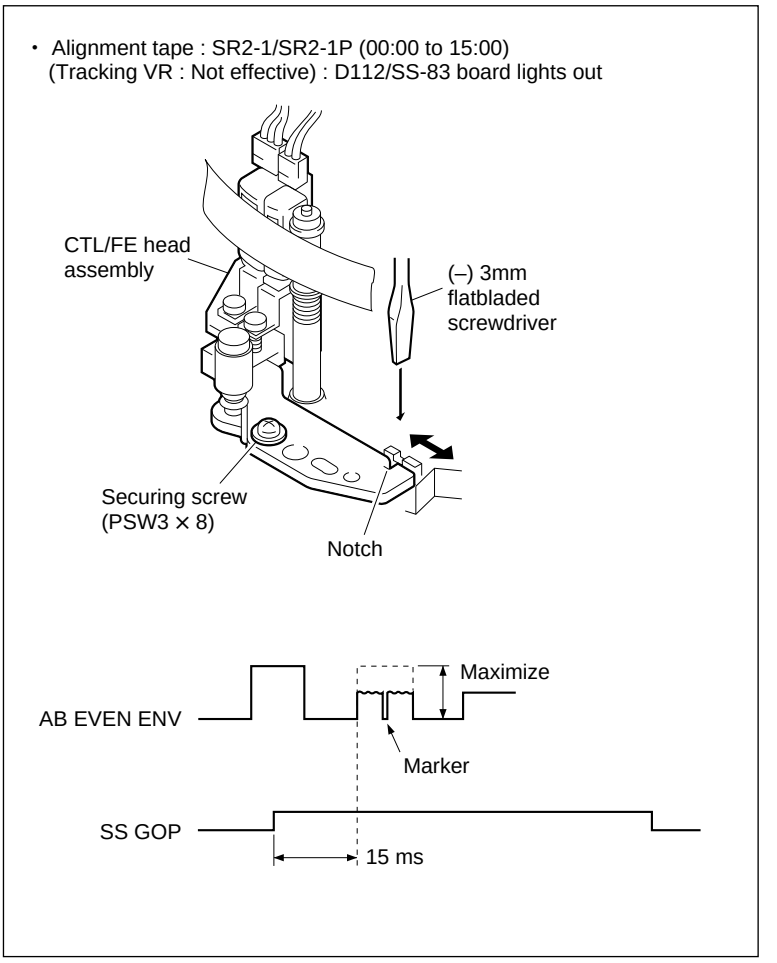
10. Tighten the Screw

Tighten the screw loosened in step 8.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

11. Recheck the CTL Head Position

Perform to steps 5 through 7 again.



CTL Head Position Adjustment

In Case the Adjustment is Performed

12. Adjust the AT Head Position

Refer to Section 4-1-9.

13. Locking Compound Applying

Refer to Section 4-1.

4-1-6. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the azimuth adjustment, head-to-tape contact adjustment, and head position adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

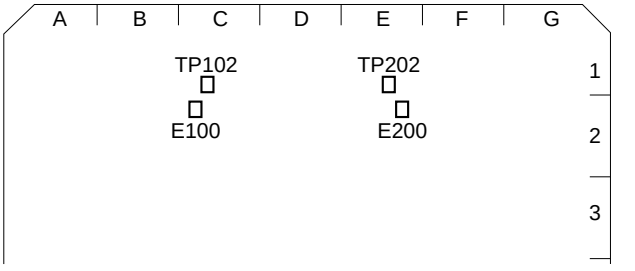
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the AT Head Height

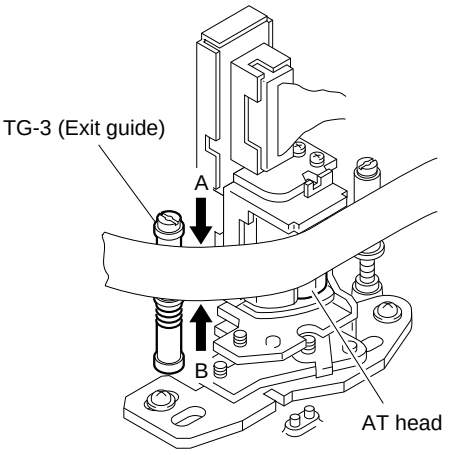
(1) Check that both levels in CH-1 and CH-2 decrease when portion A of the tape shown in the figure is pressed down.

If both levels increase, perform step 7.

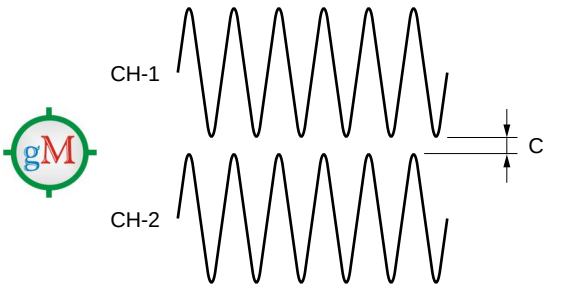
(2) Check that both levels in CH-1 and CH-2 decrease when portion B of the tape is pushed up.

If both levels increase, perform step 8.

・ Alignment tape : CR8-1A/CR8-1A PS (8:00 to 10:00)



<Audio output waveform>



Spec. : The portion C widens when pressing down aud pushing up the alignment yape.

AT Head Height Check

Adjustment

7. In Case both Levels Increase when the Tape is Pressed Down (Fig. 1)

Turn the height adjustment screw clockwise so that both output waveforms in CH-1 and CH-2 are maximum.

8. In Case both Levels Increase when the Tape is Pushed Up (Fig. 2)

(1) Turn the height adjustment screw counter-clockwise so that both output waveforms in CH-1 and CH-2 are maximum. Turn the height adjustment screw counterclockwise more about 1/2 turn.

(2) Turn the height adjustment screw clockwise and adjust so that both output waveforms in CH-1 and CH-2 maximum.

Note

To stabilize the AT head height after the adjustment, set the maximum output level with the AT head moved from bottom to top (with the height adjustment screw turned clockwise).

In Case the Adjustment is Performed

9. Adjust the AT Head Azimuth

Refer to Section 4-1-7.

10. Adjust the AT Head Head-to-tape Contact

Refer to Section 4-1-8.

11. Adjust the AT Head Position

Refer to Section 4-1-9.

12. Recheck the AT Head Height

Refer to steps 5 and 6 in this section.

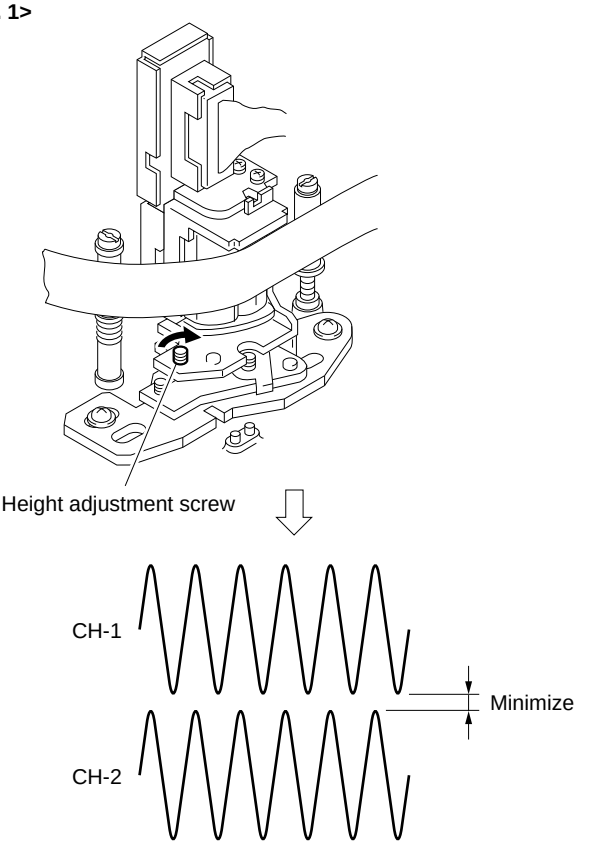
13. Re-check the AT Head

Perform the steps 9, 10 and 11 again.

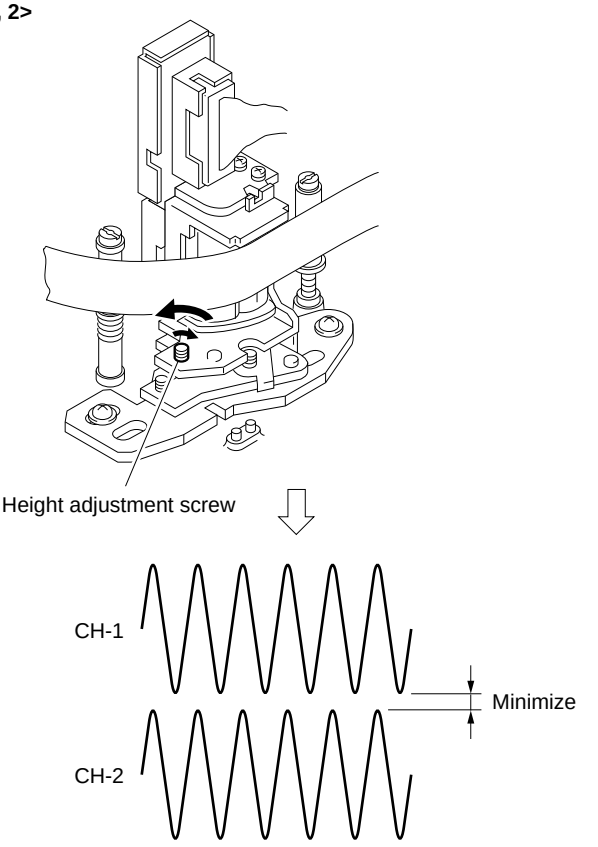
14. Locking Compound Applying

Refer to Section 4-1.

<Fig. 1>



<Fig, 2>



AT Head Height Adjustment

4-1-7. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to the head-to-tape contact adjustment, head position adjustment, and head height adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head azimuth is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
MODE : X-Y

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

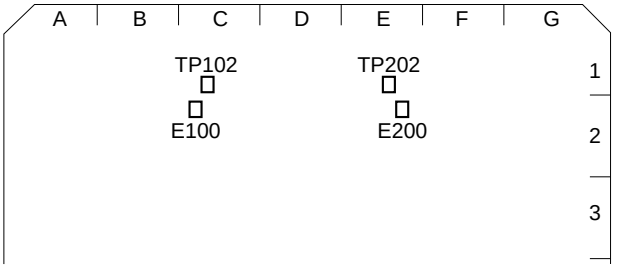
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

Check

4. Turn the Power On

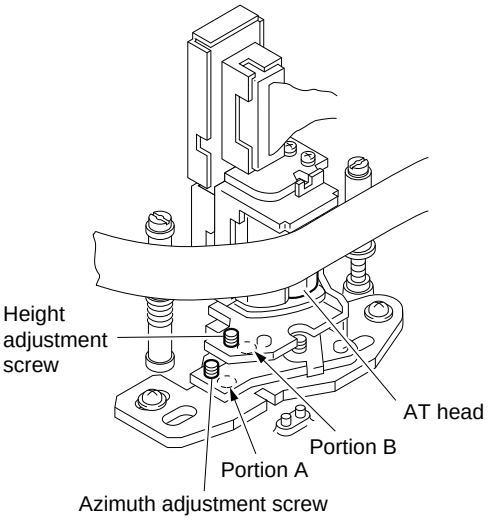
5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

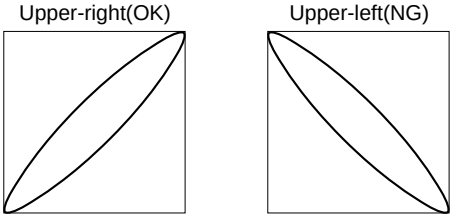
6. Check the AT Head Azimuth

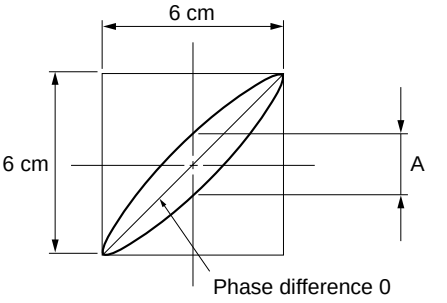
(1) Adjust the horizontal and vertical amplitudes of lissajous waveform to 6 cm each.
(2) Check that the lissajous waveform holds the upper-right shape.
(3) Check that the vertical amplitude at the center point in the horizontal direction satisfies the specification.
(4) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.
(5) If the specification in any of steps (1), (2) or (3) is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS (3:00 to 4:55)



<Lissajous waveform>





Spec. : A ≦ 0.52 cm

AT Head Azimuth Check

Adjustment

7. Adjust the AT Head Azimuth

(1) Turn the azimuth adjustment screw so that the specification is satisfied.

(2) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.

In Case the Adjustment is Performed

8. Adjust the AT Head Head-to-tape Contact

Refer to Section 4-1-8.

9. Adjust the AT Head Position

Refer to Section 4-1-9.

10. Check the AT Head Height

Refer to Section 4-1-6.

11. Check the AT Head Azimuth

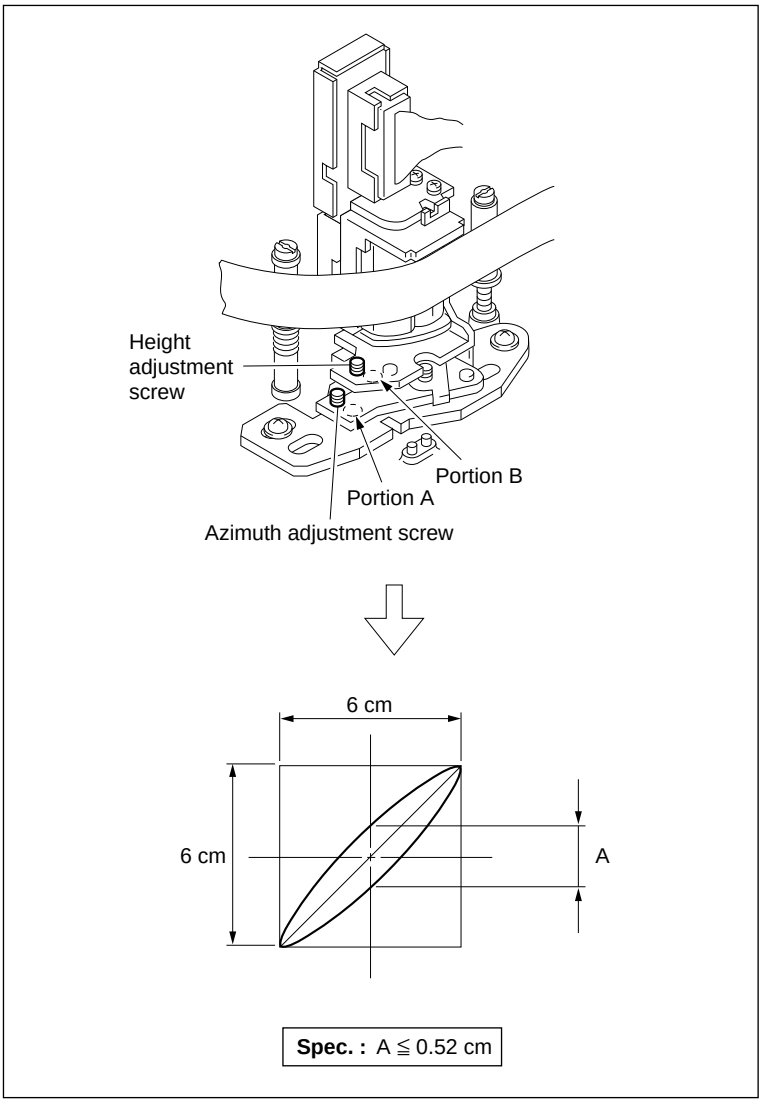
Refer to steps 5 and 6 in this section.

12. Re-check the AT head

Rerform the steps 8, 9 and 10 again.

13. Locking Compound Applying

Refer to Section 4-1.



AT Head Azimuth Adjustment

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4-1-8. AT Head Head-to-tape Contact Check and Adjustment

Note

The AT head head-to-tape contact adjustment is closely related to the head position adjustment, head height adjustment, and head azimuth adjustment.
Be sure to perform adjustments (or checks) according to “In case the adjustment is performed” in this section when the AT head head-to-tape contact is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Torque screwdriver (6 kgf•cm) (JB-5251): J-6252-510-A
- Torque screwdriver’s bit (+2 mm, l= 75 mm): J-6323-420-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

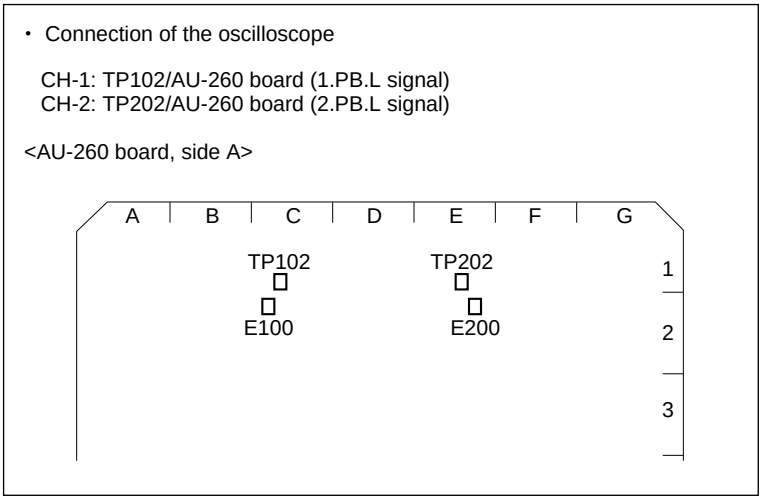
CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 1 ms/DIV

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

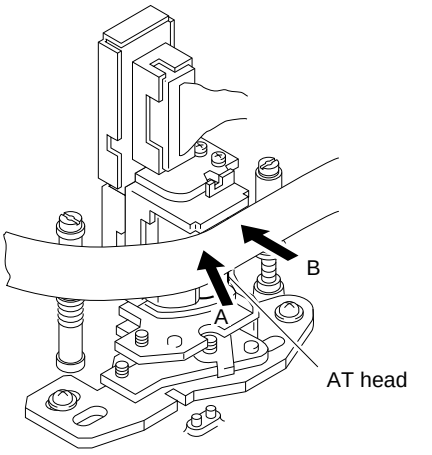
6. Check the AT Head Head-to-tape Contact

(1) Push portions A and B of the tape shown in the figure slightly. (It means increasing the tape's wrapping angle against the AT head.)

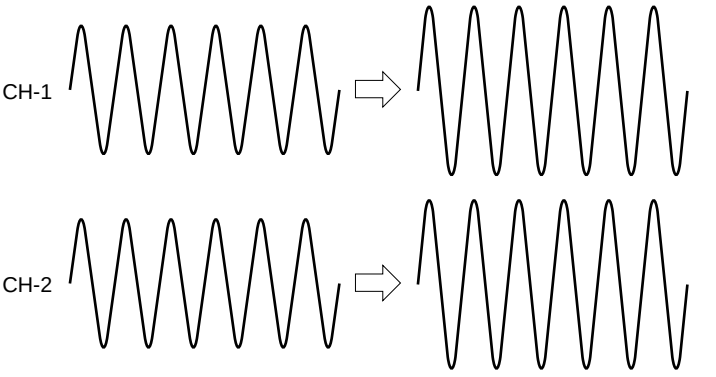
(2) Check that both increasing values of the output levels in CH-1 and CH-2 satisfy the specification.

If the specification is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS(3:00 to 4:55)



<AUDIO output waveform>



Spec. : Both increasing values of the output levels in CH-1 and CH-2 are within 5%.

AT Head Head-to-tape Contact Check

Adjustment

7. Loosen the Screws

Loosen the two head securing screws by 1/4 to 1/2 turn.

8. Adjust the AT Head Head-to-tape Contact

(1) Insert a 2 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the AT head position so that the output waveform is maximum.

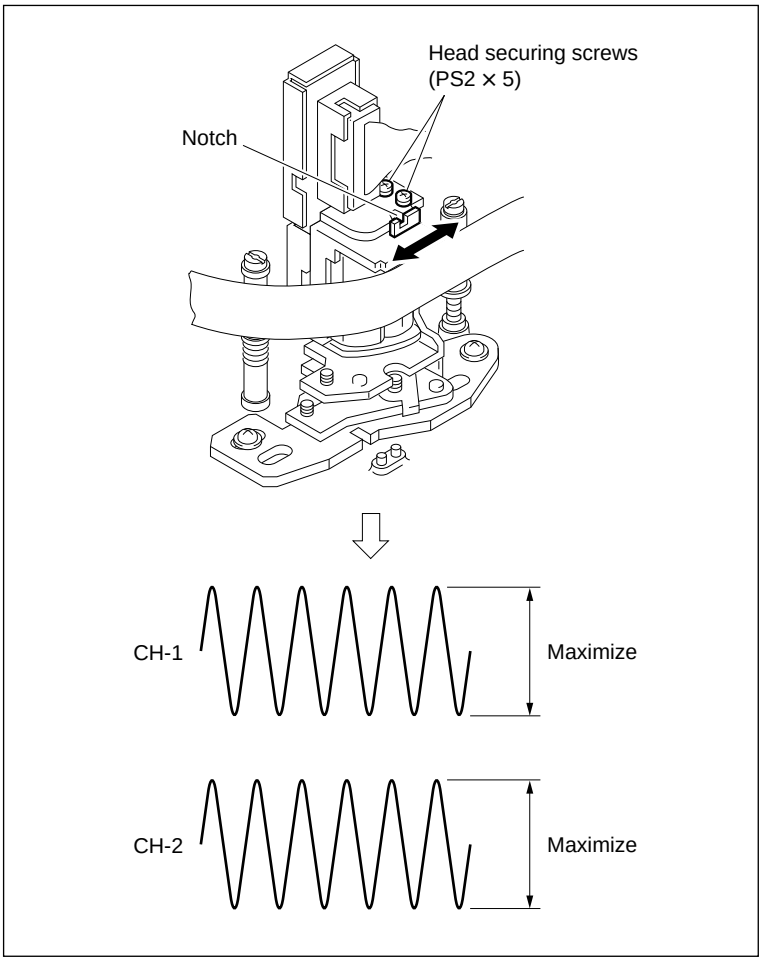
9. Tighten the Screws

Tighten the two securing screws loosened in step 7.

Tightening torque: 19.6×10^{-2} N•m (2 kgf • cm)

10. Recheck the AT Head Head-to-tape Contact

Refer to steps 5 and 6 in this section.



AT Head Head-to-tape Contact Adjustment

In case the adjustment is performed

11. Check the AT Head Position

Refer to Section 4-1-9.

12. Check the AT Head Height

Refer to Section 4-1-6.

13. Check the AT Head Azimuth

Refer to Section 4-1-7.

4-1-9. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as reference.
- The AT head position adjustment is closely related to the head height adjustment, head azimuth adjustment, and head-to-tape contact adjustment.
  Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP304/SS-83 board (CTL PULSE signal)
CH-2 : TP102/TC-102 board (PB LTC signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms to 500 µs/DIV

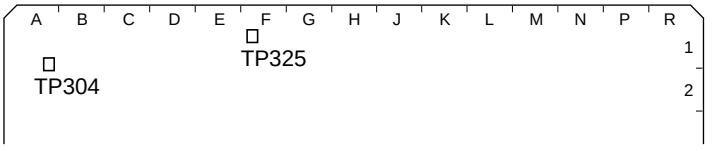
3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

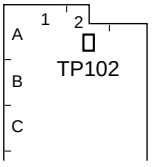
- Connection of the oscilloscope

  CH-1:TP304/SS-83 board (CTL PULSE Signal)
  CH-2:TP102/TC-102 board (PB LTC Signal)
  TRIG:TP325/SS-83 board (SS GOP Signal)

<SS-83 BOARD, Side A>



<TC-102 BOARD, Side A>



Preparation

Check

4. Turn the Power On

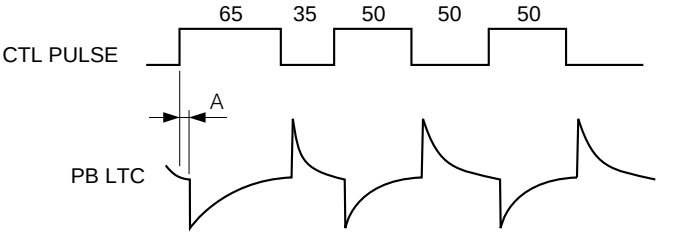
5. Play Back the Alignment Tape

Play back the SR2-1/P (00:00 to 15:00).

6. Check the AT Head Position

Check that the positional relationship between the rising edges of CTL's 65:35 pulse and PB LTC's 65:35 waveform signals satisfies the specification.
If the specification is not satisfied, perform steps 7 and later.

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)



Spec. : A = 0 ±600 µs

AT Head Position Check

Adjustment

7. CL Guide Rail Removal
Remove the two screws, then remove the CL guide rail.

8. Loosen the Screws
Loosen the two securing screws of the AT head assembly by 1/4 to 1/2 turn.

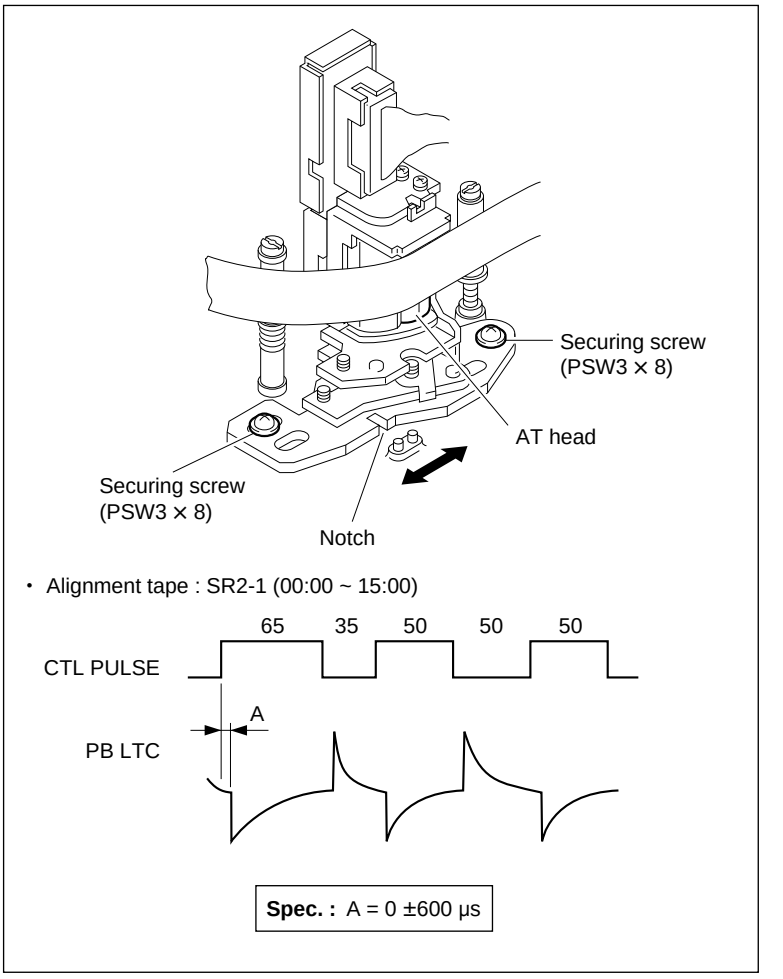
9. Adjust the AT Head Position
(1) Insert a 3 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the Screws
Tighten the two screws loosened in step 8.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

11. Recheck the AT Head Position
Refer to steps 5 and 6 in this section.

12. CL Guide Rail Installation
Install the CL guide rail with two screws.



AT Head Position Adjustment

In Case the Adjustment is Performed

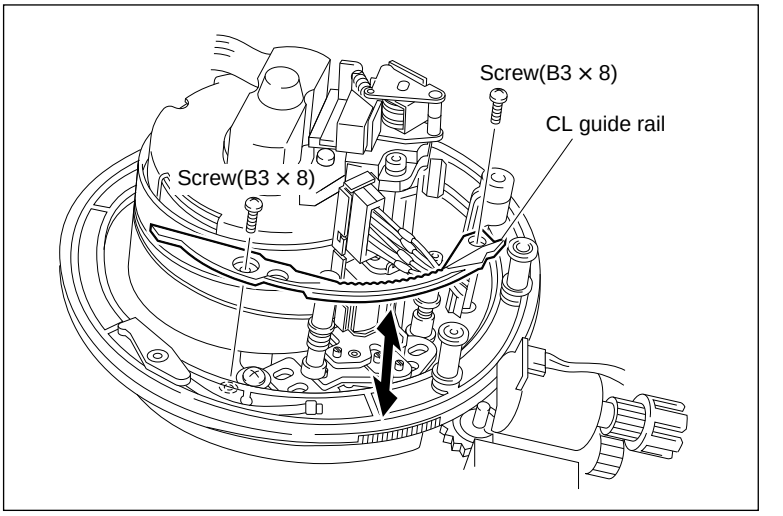
13. Check the AT Head Height
Refer to Section 4-1-6.

14. Check the AT Head Azimuth
Refer to Section 4-1-7.

15. Check the AT Head Head-to-tape Contact
Refer to Section 4-1-8.

16. Check the AT Head Position
Refer to steps 5 and 6 in this section.

17. Locking Compound Applying
Refer to Section 4-1.



CL guide rail Removal/Installation

4-1-10. Audio Level Check and Adjustment in REV Mode

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2. PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

"1.PB.L" signal (TP102) is the playback signal of the CH-1 of the AT head.
"2.PB.L" signal (TP202) is the playback signal of the CH-2 of the AT head.

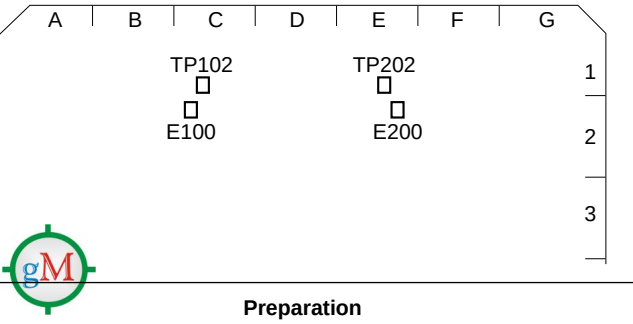
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the Audio Output Level

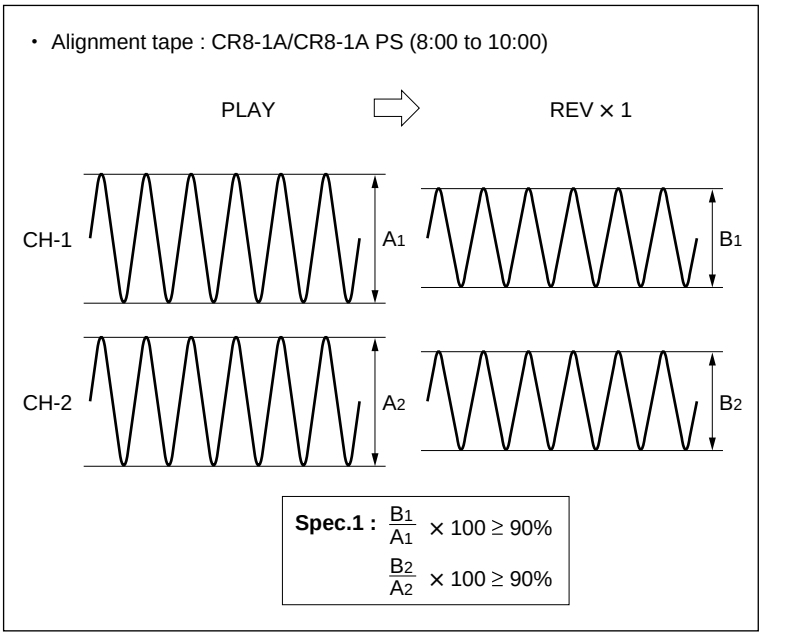
(1) Check the audio output level A_1 in CH-1.
(2) Check the audio output level A_2 in CH-2.

7. Put the Unit into the REV × 1 Mode

8. Check the Audio Output Level

(1) Check that the audio output level B_1 in CH-1 satisfies specification 1.
(2) Check that the audio output level B_2 in CH-2 satisfies specification 1.

If specification 1 is not satisfied, perform steps 9 and later.



Audio Level Check in REV Mode

Adjustment

9. Adjust the TG-5 (Threading Roller) Height

(1) Play back the 1 kHz, 0VU signal portion (8:00 to 10:00) on the CR8-1A/PS.
(2) Put the unit into the REV × 1 mode.
(3) In case the level increases when portion A of the tape shown in the figure is pressed down, turn the upper flange of TG-5 clockwise using a tape guide adjustment driver.
In case the level increases when portion B is pushed up, turn the upper flange of TG-5 counterclockwise.

Note

First, press the EJECT button to unthread the tape when turning the upper flange of TG-5.

(4) Check the audio output level satisfies specification 1. (Refer to steps 5 through 8.)

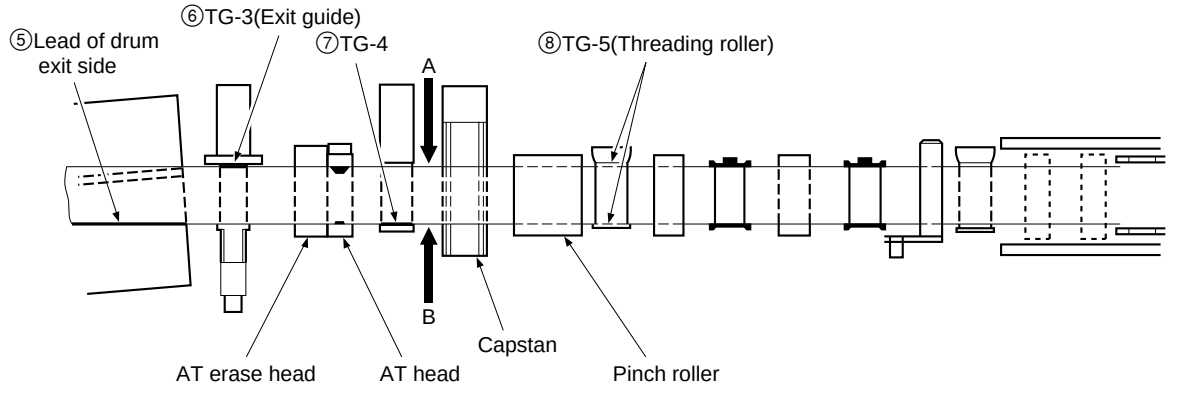
If the specification 1 is not satisfied, repeat steps (1) through (3) mentioned above.

10. Check the Tape Running at Tape Exit Side

In the modes below, check that the tape running condition satisfies specification 2.
(1) PLAY mode
(2) REV × 1 mode

If specification 2 is not satisfied, adjust the tape guides height at the tape exit side. (Refer to steps 12 through 14 (at the Tape Exit Side) in Section 4-1-2.)

If the height of the tape guide is adjusted, perform the video tracking check.
(Refer to Section 4-1-3.)



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Audio Level Adjustment in REV Mode

Section 5
Electrical Alignment after Main Parts Replacement

5-1. Electrical Alignment Overview

5-1-1. Notes on Electrical Alignment

- Be sure to perform the adjustment in order.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.

  Note

  NV-RAM control menu for the servo and DT systems have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 4 of the maintenance manual Part 1.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the maintenance manual Part 1 “Appendix B” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

5-1-2. Outline of Electrical Alignment

In Section 5 explains the electrical alignment after replacing the following parts.

- Drum assembly / Upper drum assembly ..... Section 5-2
- AT head ..... Section 5-3

5-2. Electrical Adjustment after Replacing the Drum

5-2-1. Adjustment Overview

Perform this section when the drum assembly or upper drum assembly was replaced.

For adjustment items and its order, refer to “Adjustment Items” (next page).

Note

During adjusting, besure to reattach the upper lid unless the PC board is extended.

Tools List

To perform the adjustment after replacing the drum, prepare the following equipment and fixtures.

- Analog composite video signal generator
  For DNW-A75: TEKTRONIX TSG-170A or equivalent
  For DNW-A75P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Analog component video monitor
  (NTSC/PAL switchable type)

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
  EX-556 (Part No. J-6277-212-A)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony’s standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.
- Cleaning tape: BCT-5CLN
  (Sony’s standard products)
- Alignment tapes
  For DNW-A75: SR2-1 (Part No. 8-960-075-11),
  SR5-1 (Part No. 8-960-075-01),
  CR2-1B (Part No. 8-960-096-01),
  CR2-1 PS (Part No. 8-960-096-51),
  CR5-1B (Part No. 8-960-096-41),
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A75P: SR2-1P (Part No. 8-960-075-61),
  SR5-1P (Part No. 8-960-075-51),
  CR2-1B (Part No. 8-960-096-01),
  CR2-1B PS (Part No. 8-960-096-51),
  CR5-1B PS (Part No. 8-960-096-91),
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

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Adjustment Items

No.	Item		Adjustment point	Remarks
5-2-3	Drum phase adjustment		A11 : RF SWITCHING POS.	(Automatic adjustment)
		Data save	A12 : NV-RAM CONTROL	
5-2-4	DT system adjustment (Standard video system) (Analog Betacam)			
		Offset level	A030 : HEAD OFFSET LEVEL	(Automatic adjustment)
		Drive gain	A031 : DRIVE GAIN	(Automatic adjustment)
		Data save	A032 : NV-RAM CONTROL	
5-2-5	EQ equalizer adjustment (Betacam SX)		A11 : EQUALIZER	(Automatic adjustment)
		Data save	A1F : NV-RAM CONTROL	
5-2-6	Recording current adjustment (Betacam SX)		A12 : REC CURRENT	(Automatic adjustment)
		Data save	A1F : NV-RAM CONTROL	
5-2-7	EQ RF output level adjustment (Analog Betacam)			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
			Data save	A3F : NV-RAM CONTROL
5-2-8	DM RF output level adjustment (Analog Betacam)			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
5-2-9	OMC carrier balance adjustment (Analog Betacam)			
		METAL Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
		METAL C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
		OXIDE C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
		OXIDE Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
5-2-10	OMC carrier balance provisional adjustment (Analog Betacam)	**Note** This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (Section 5-2-9) using the spectrum analyzer. Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 5-2-9) using the spectrum analyzer at a later date.		
5-2-11	Demodulator limiter balance adjustment (Analog Betacam)			
		Y	⊘RV502/DM-89	TP501/DM-89
		C	⊘RV702/DM-89	TP8/DM-89

(continue)

(Continued)

No.	Item		Adjustment point	Remarks
5-2-12	PB frequency response adjustment (Analog Betacam)			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	
5-2-13	DM RF output level readjustment (Analog Betacam)			
		OXIDE C	⊘RV212/DM-89	TP3/DM-89
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE Y	⊘RV407/DM-89	TP7/DM-89
5-2-14	RF envelope adjustment (Analog Betacam)			
		Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
5-2-15	Impact error offset adjustment (Analog Betacam)			
		Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	Video monitor
5-2-16	TBC Y/C delay adjustment (Analog Betacam)			
		METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24∗1	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT
5-2-17	AFM RF level adjustment (Betacam SP)		⊘RV500/AU-260	TP570/AU-260, TP580/AU-260
5-2-18	DT system adjustment (Another video system) (Analog Betacam)			
		Offset level	A030 : HEAD OFFSET LEVEL	(Automatic adjustment)
		Drive gain	A031 : DRIVE GAIN	(Automatic adjustment)
		Data save	A032 : DATA SAVE	

∗1: RV504 is not equipped on the TBC-24 board of board number suffixes 11, 12, and 13.

5-2-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the Betacam / Betacam SP PB system alignment.

1. Reset the all switches on the DM-89 and TBC-23A boards to the factory settings.

   Note

   Before removing the board, turn off the power.

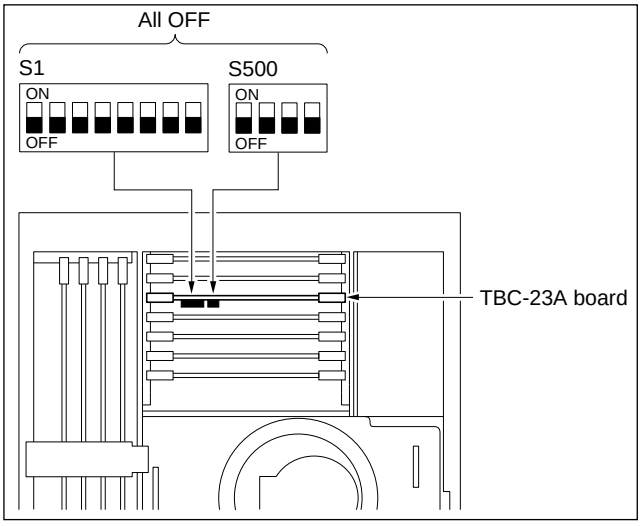
Board	Ref. No.	Factory setting
DM-89	S101, S102, S301, S302	NOR (right side)
	S501	ON (right side)
	S901	all OFF (down side)
TBC-23A	S1, S500	all OFF (down side)

2. Set the VTR's switches as follows:

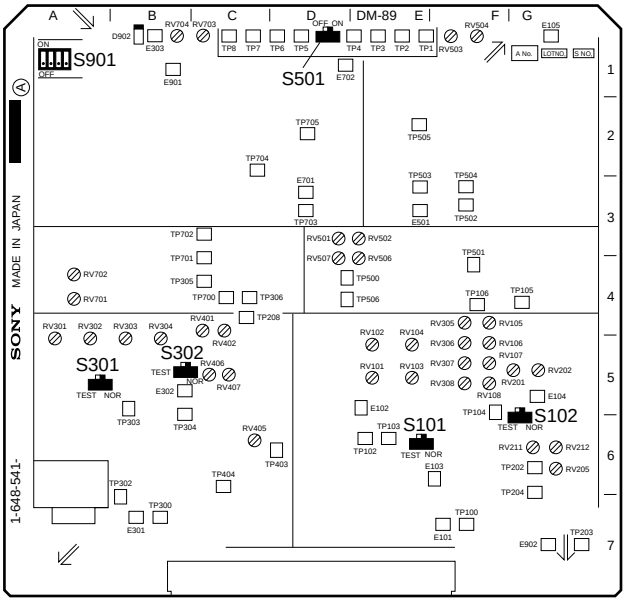
Location Item	Customer setting	Setting at adjustment
SS-83 board DIP switch S1100-1 (M-1)	_____	⇨ ON (up position)
Note Set to treat the extended menu of the setup menu.		
Sub control panel		
CHARACTER switch	_____	⇨ ON
OUT REF switch	_____	⇨ REF
PROCESS CONTROL switch	_____	⇨ LOCAL
• VIDEO switch	_____	⇨ PRESET
• CHROMA switch	_____	⇨ PRESET
• SET UP switch or BLACK LEVEL switch	_____	⇨ PRESET
• Y/C DELAY switch	_____	⇨ PRESET
• CHROMA PHASE switch	_____	⇨ PRESET
REC INHIBIT switch	_____	⇨ OFF
KEY INHIBIT switch	_____	⇨ OFF
CAPSTAN LOCK switch	_____	⇨ 2FD
Upper control panel		
TC (LTC/AUTO/VISC)	_____	⇨ LTC
TC GENERATOR: INT/EXT PRESET/REGEN FREE RUN/REC RUN	 _____ _____ _____	 ⇨ INT ⇨ REGEN ⇨ REC RUN
REMOTE : 9P 50P	_____ _____	⇨ Off (Light off) ⇨ Off (Light off)

3. For DNW-A75, be sure to adjust in the 525/60 system.
   For DNW-A75P, be sure to adjust in the 625/50 system.
   If differed, change the operation system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-A75 only: Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting	Setting at adjustment
709 : CAV LEVEL FORMAT		
1. OUTPUT CAV LEVEL	_____	⇨ B-CAM
713 : VIDEO SETUP REFERENCE LEVEL		
0. MASTER LEVEL	_____	⇨ 0.0%
3. BETACAM PB LEVEL	_____	⇨ MSTER
4. OUTPUT LEVEL	_____	⇨ MSTER



S1 and S500 on TBC-23A Board



DM-89 Board (Side A)

5-2-3. Drum Phase Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A75: SR2-1 (for 525/60 system)
DNW-A75P : SR2-1P (for 625/50 system)

1. Insert the alignment tape SR2-1 or SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select “AUTO”.
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

5-2-4. DT System Adjustment (Standard Video System) (Analog Betacam)

Prepare the following alignment tape to perform this adjustment.
DNW-A75: CR5-1B or CR5-2A
(for NTSC analog Betacam)
DNW-A75P : CR5-1B PS or CR5-2A PS
(for PAL analog Betacam)

Offset level adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

Drive gain adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS : Time code 00:14:00:00
   CR5-2A / CR5-2A PS : Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   - The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   - The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   - The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

10. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

11. To exit the maintenance mode, press the MENU button five times.
    - The alignment tape is ejected automatically.

5-2-5. EQ Equalizer Adjustment (Betacam SX)

Prepare the following alignment tape to perform this adjustment.
DNW-A75: SR5-1 (for 525/60 system)
DNW-A75P : SR5-1P (for 625/50 system)

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.
3. Enter A11 : EQUALIZER.
   - Message “Auto Adjust (Push SET)” is displayed on the video monitor.
4. Check that there is the ∗ mark to “ALL” on the video monitor.
   If not, set the ∗ mark to “ALL” with the search dial turned.
5. To execute the automatic adjustment, press the SET button once.
   - Message “Auto Adjust Complete” is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the alignment tape.

Data save (Store the adjusted data)

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

10. To exit the maintenance mode, press the MENU button four times.

5-2-6. Recording Current Adjustment (Betacam SX)

Prepare the recording tape to perfome this adjustment.

1. Insert the recording tape.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A12 : REC CURRENT.
   - Message “Auto Adjust (Push SET)” is displayed on the video monitor.
4. Check that there is the ∗ mark to “ALL” on the video monitor.
   If not, set the ∗ mark to “ALL” with the search dial turned.
5. To execute the automatic adjustment for the recording current, press the SET button once on the lower control panel.
   - Message “Auto Adjust Complete” is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the recording tape.

Data save (Store the adjusted data)

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

10. To exit the maintenance mode, press the MENU button four times.

5-2-7. EQ RF Output Level Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

DNW-A75: CR5-1B and CR5-2A
(for NTSC analog Betacam)
DNW-A75P : CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

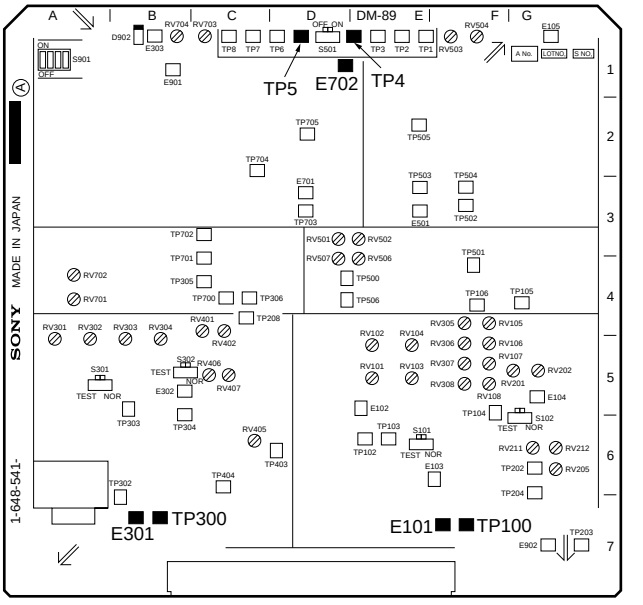
Measuring equipment : Oscilloscope

1. Turn off the power.
2. Extend the DM-89 board with an extension board EX-377.
3. Turn on the power.
4. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
5. Enter A30 : EQ VR in A3 : BETACAM PB ADJUST.

Note

How to change the data

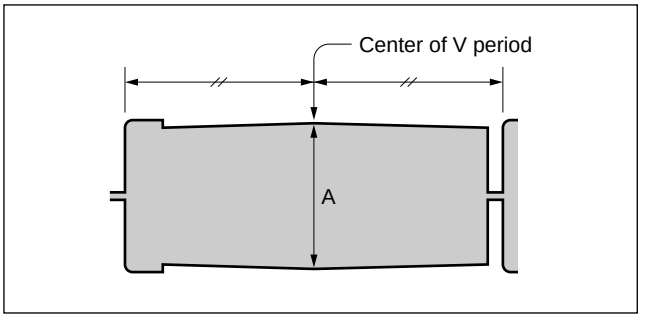
(1) Set the ∗ mark on the video monitor to the line to be changed the data by turning the search dial.
(In the time data display area of the VTR, display the item by turning it, “RF G M-Y-A” for example.)
(2) To change the data, turn the search dial with the JOG button pressing.



DM-89 Board (Side A)

METAL Y adjustment

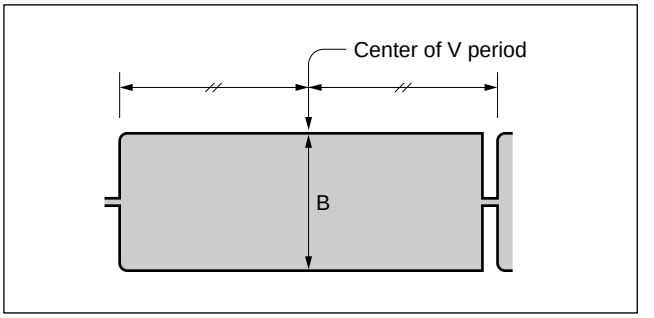
6. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   AC 100 mV/DIV
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   DC 1 V/DIV
   TIME: 2 ms/DIV
   TRIG: CH-2
7. To perform the tape operation, press the SET button once on the lower control panel.
8. Play back the flat field signal portion (24:00 to 26:00) of the following alignment tape in PLAY mode.
   For DNW-A75: CR5-1B
   For DNW-A75P: CR5-1B PS
9. To operate the maintenance mode, press the MENU button on the lower control panel.
10. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL Y-A (ch-A of METAL Y).
    Adj. point: A30 : EQ VR : RF GAIN METAL-Y-A
    Specification: A = 380 ±20 mV p-p
11. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL Y-B (ch-B of METAL Y).
    Adj. point: A30 : EQ VR : RF GAIN METAL-Y-B
    Specification: A = 380 ±20 mV p-p
12. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL Y-A and METAL Y-B until they are identical amplitude.



13. To perform the tape operation, press the SET button once.
14. Stop the playback of the alignment tape.

METAL C adjustment

15. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
    CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
16. Play back the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B / CR5-1B PS in PLAY mode.
17. To operate the maintenance mode, press the MENU button once.
18. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL C-A (ch-A of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-A
    Specification: B = 380 ±20 mV p-p
19. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL C-B (ch-B of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-B
    Specification: B = 380 ±20 mV p-p
20. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL C-A and METAL C-B until they are identical amplitude.



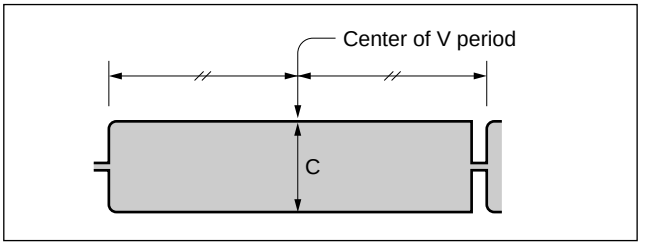
21. To perform the tape operation, press the SET button once.
22. Stop the playback of the alignment tape, then eject it.

OXIDE C adjustment

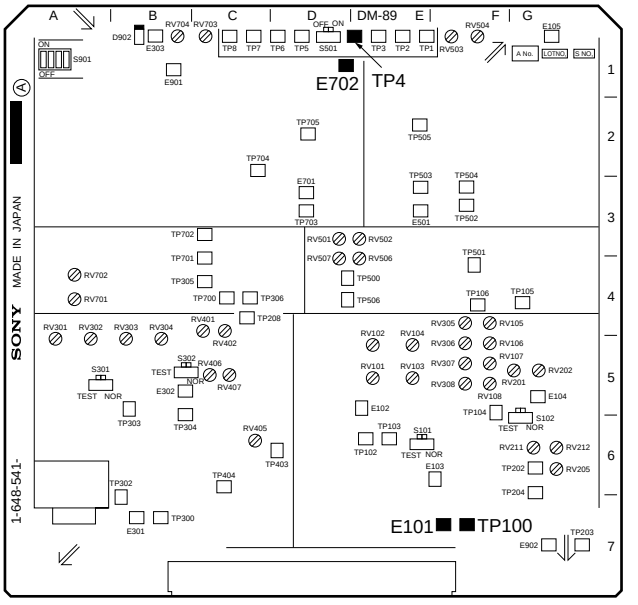
Note

The connections and settings of the oscilloscope are the same as “METAL C adjustment”.

23. Play back the 75% color-bar signal portion (0:00 to 3:00) of the following alignment tape in PLAY mode.
    For DNW-A75: CR5-2A
    For DNW-A75P: CR5-2A PS
24. To operate the maintenance mode, press the MENU button once.
25. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE C-A (ch-A of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-A
    Specification: C = 250 ± 20 mV p-p
26. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE C-B (ch-B of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-B
    Specification: C = 250 ± 20 mV p-p
27. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE C-A and OXIDE C-B until they are identical amplitude.



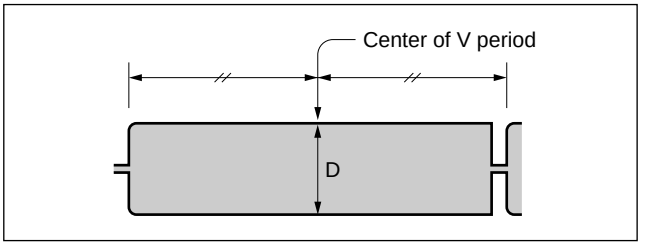
28. To perform the tape operation, press the SET button once.
29. Stop the playback of the alignment tape.



DM-89 Board (Side A)

OXIDE Y adjustment

30. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
    CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
31. Play back the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A / CR5-2A PS in PLAY mode.
32. To operate the maintenance mode, press the MENU button once.
33. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE Y-A (ch-A of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-A
    Specification: D = 250 ± 20 mV p-p
34. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE Y-B (ch-B of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-B
    Specification: D = 250 ± 20 mV p-p
35. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE Y-A and OXIDE Y-B until they are identical amplitude



36. To perform the tape operation, press the SET button once.
37. Stop the playback of the alignment tape, then eject it.
38. To operate the maintenance mode, press the MENU button once.
39. To exit A30 : EQ VR, press the MENU button once.

Data save (Store the adjusted data)

40. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.
41. To exit the maintenance mode, press the MENU button four times.

5-2-8. DM RF Output Level Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

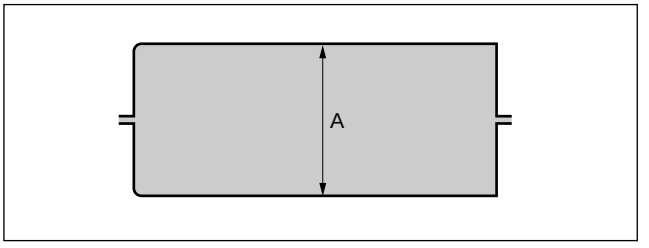
DNW-A75: CR5-1B and CR5-2A
(for NTSC analog Betacam)

DNW-A75P : CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment : Oscilloscope

METAL Y adjustment

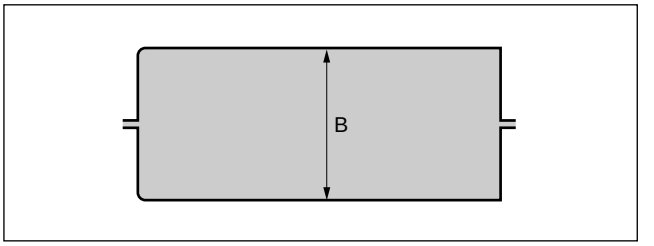
1. Connect and set the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), AC 100 mV/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV211/DM-89(G-6)
   Specification: A = 400 ±40 mV p-p



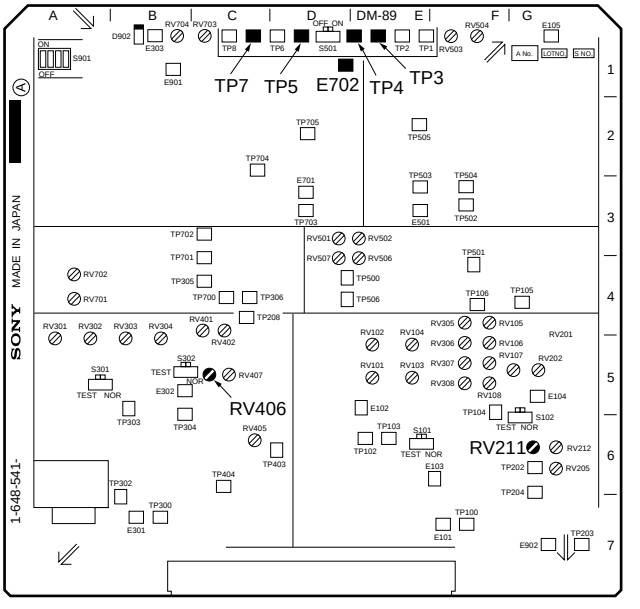
3. Stop the playback of the alignment tape.

METAL C adjustment

4. Change the connection of the oscilloscope as follows:
   CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
5. During play back the alignment in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV406/DM-89(C-5)
   Specification: B = 400 ±40 mV p-p



6. Stop the playback of the alignment tape, then eject it.



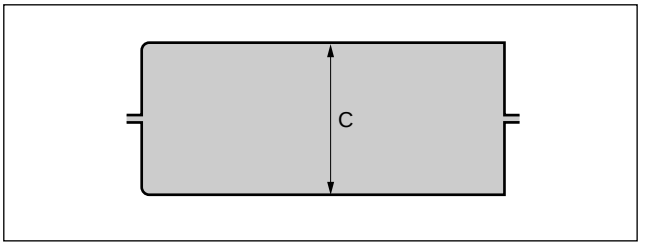
DM-89 Board (Side A)

OXIDE C adjustment

Note

Connection of the oscilloscope remains unchanged.

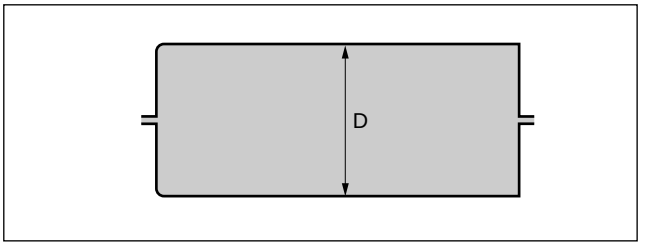
7. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ◓RV407/DM-89(C-5)
   Specification: C = 400 ± 40 mV p-p



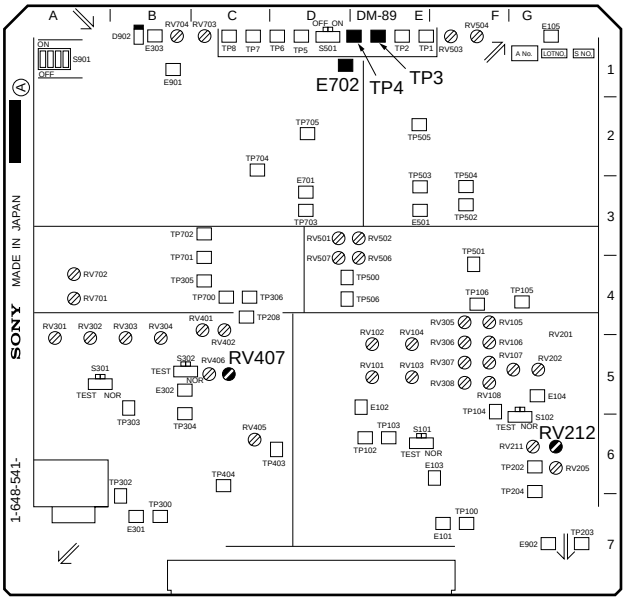
8. Stop the playback of the alignment tape.

OXIDE Y adjustment

9. Change the connection of the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
10. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
    PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
    Adj. point: ◓RV212/DM-89(G-6)
    Specification: D = 400 ± 40 mV p-p



11. Stop the playback of the alignment tape.



DM-89 Board (Side A)

http://getMANUAL.com

5-2-9. OMC Carrier Balance Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

DNW-A75: CR5-1B and CR5-2A
(for NTSC analog Betacam)

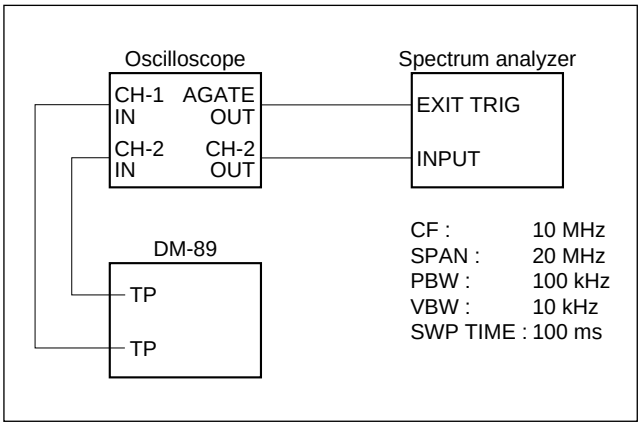
DNW-A75P : CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment : Spectrum analyzer
Oscilloscope

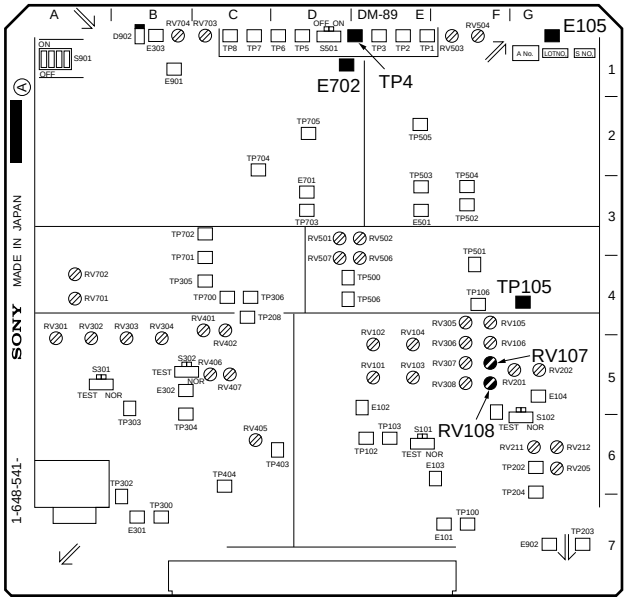
Note

If the network analyzer is not available, perform "5-2-10. OMC Carrier Balance Provisional Adjustment".

1. Connect and set the spectrum analyzer as follows:



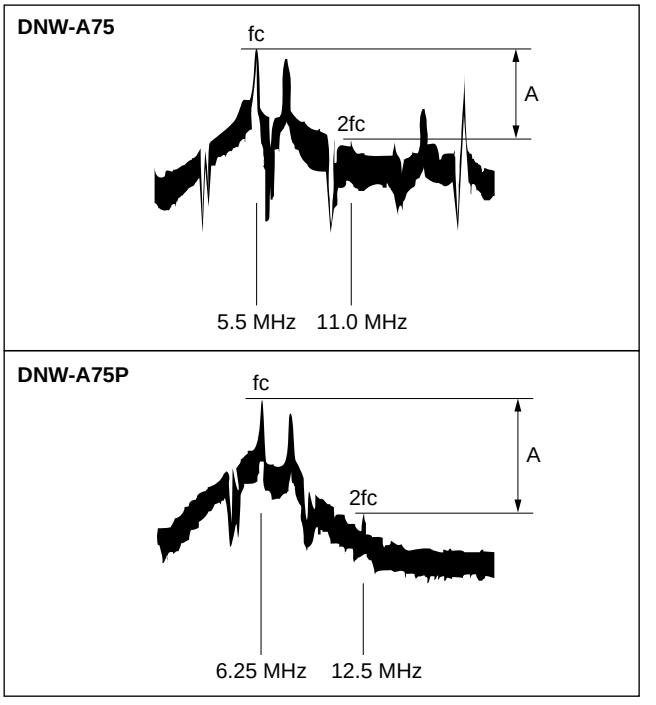
Connection and Setting of Spectrum Analyze



DM-89 Board (Side A)

OXIDE Y adjustment

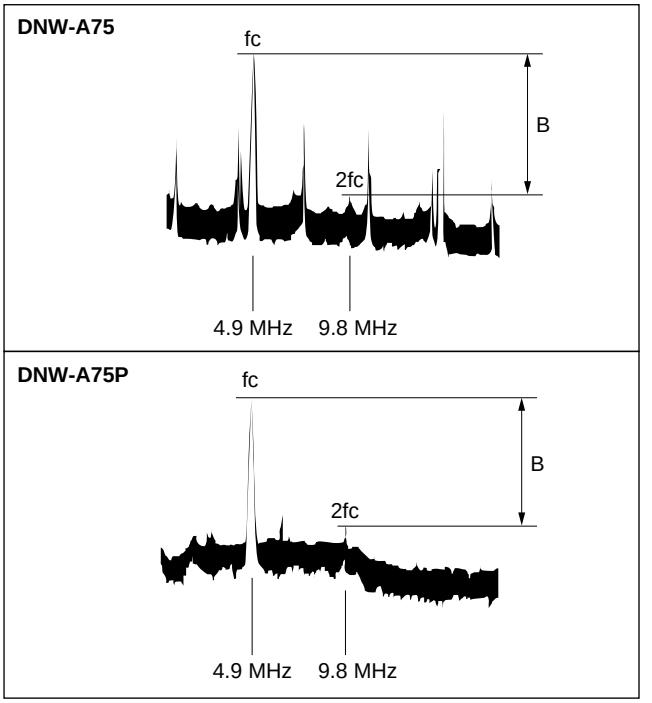
2. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), AC 1 V/DIV
   GND: E105/DM-89(G-1)
   TIME: 5 ms/DIV
   TRIG: CH-1, − slope
3. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
   Specification: A ≧ 35 dB



4. Stop the playback of the alignment tape.

OXIDE C adjustment

5. Change the connection of the oscilloscope as follows:
   CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
   CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)
6. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
   Specification: B ≧ 35 dB



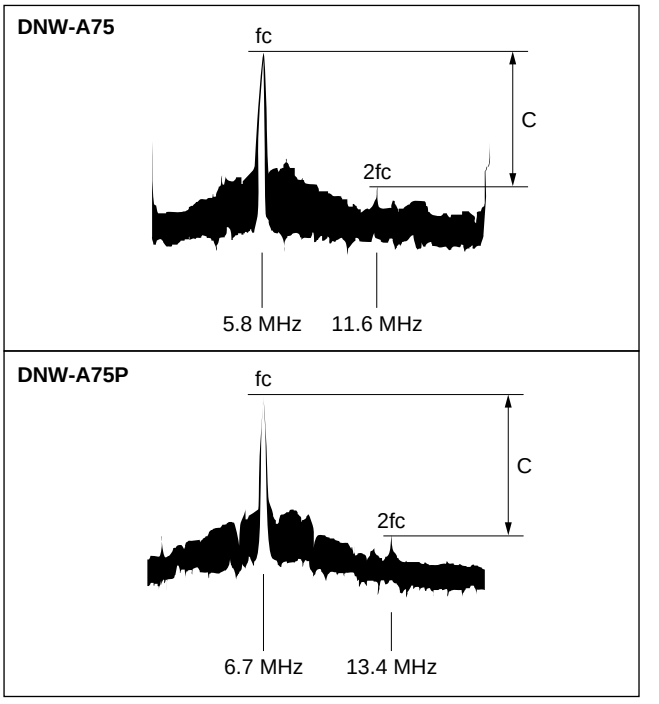
7. Stop the playback of the alignment tape, then eject it.

METAL C adjustment

Note

Connection of the oscilloscope remains unchanged.

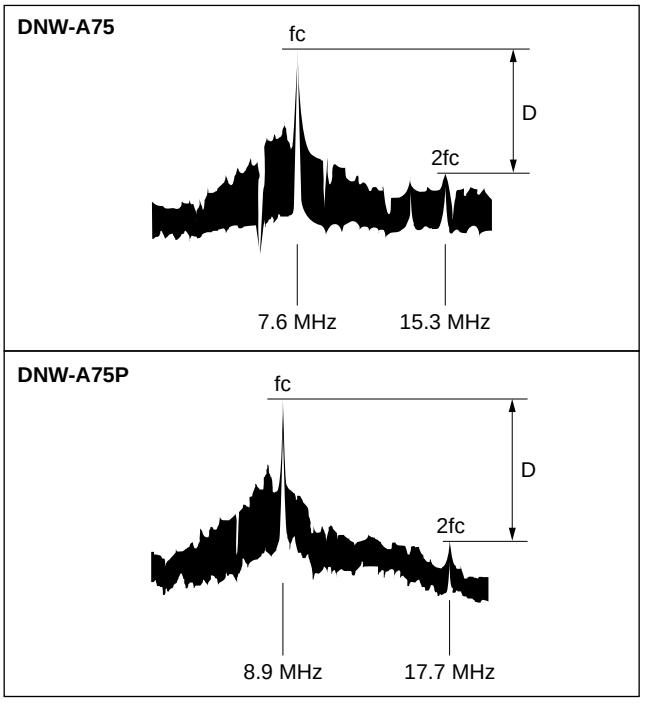
8. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
   Specification: C ≧ 40 dB



9. Stop the playback of the alignment tape.

METAL Y adjustment

10. Change the connection of the oscilloscope as follows:
    CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
    CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)
11. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
    PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
    Adj. points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
    Specification: D ≧ 40 dB



12. Stop the playback of the alignment tape.

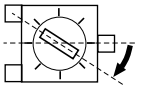
5-2-10. OMC Carrier Balance Provisional Adjustment (Analog Betacam)

Notes

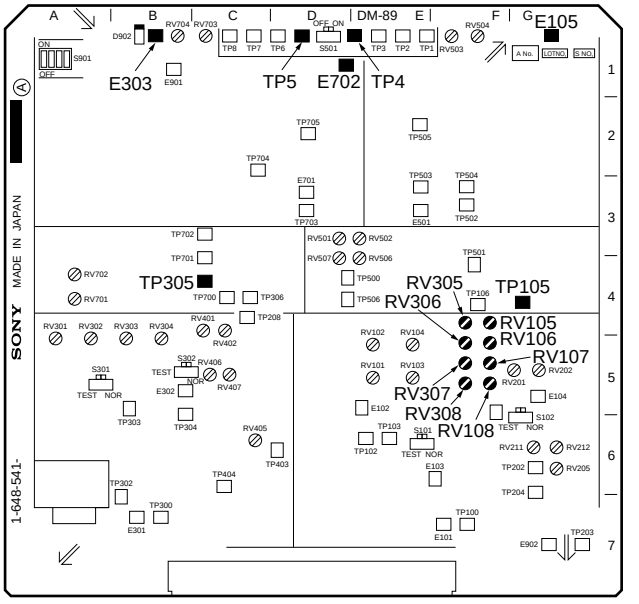
- This provisional adjustment explains how to adjust without using the spectrum analyzer.
  When the performed "5-2-9. OMC Carrier Balance Adjustment" using the spectrum analyzer, this provisional adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to perform "5-2-9. OMC Carrier Balance Adjustment" using the spectrum analyzer.

Settings of RVs

Set the following RVs on the DM-89 board to specified position respectively as shown below.



RV105 (F-4)
RV106 (F-5)
RV107 (F-5)
RV108 (F-5)
RV305 (F-4)
RV306 (F-5)
RV307 (F-5)
RV308 (F-5)



DM-89 Board (Side A)

5-2-11. Demodulator Limiter Balance Adjustment (Analog Betacam)

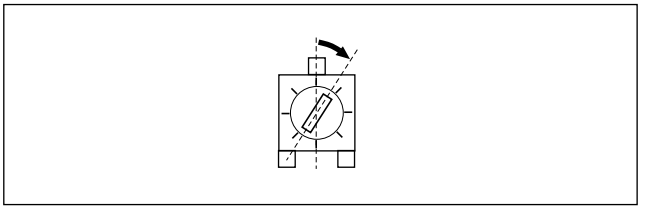
Prepare the following alignment tapes to perform this adjustment.
DNW-A75: CR5-1B (for NTSC analog Betacam)
DNW-A75P : CR5-1B PS (for PAL analog Betacam)

Measuring equipment : Spectrum analyzer
Oscilloscope

Note

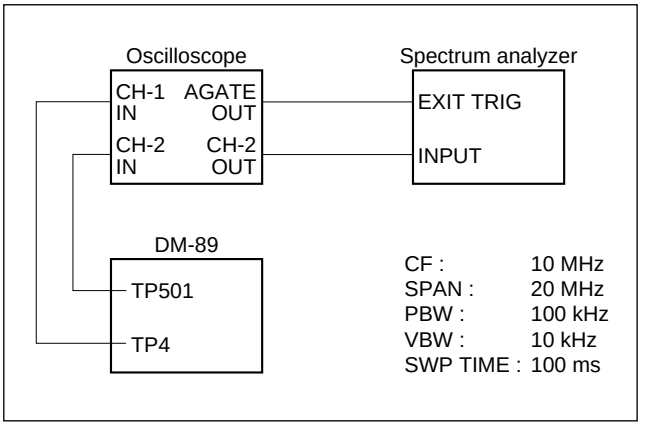
For the Y adjustment:
When the spectrum analyzer is not available for an urgent maintenance, omit steps 2 through 4 in the Y adjustment. Be sure to perform the steps 2 through 4 in the Y adjustment at a later date.

1. Set RV502/DM-89(E-3) to the specified position as shown figure be



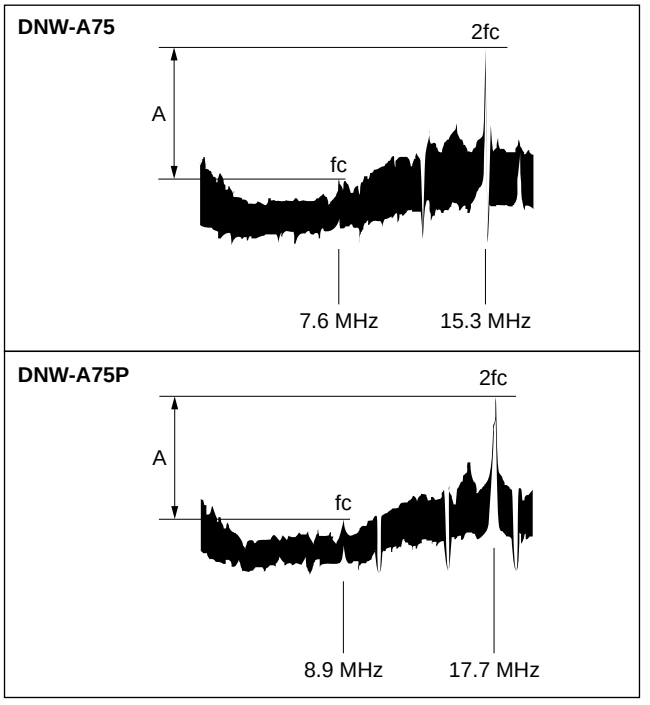
Y adjustment

2. Connect and set the spectrum analyzer as follows :



Connection and Setting of the Spectrum Analyzer

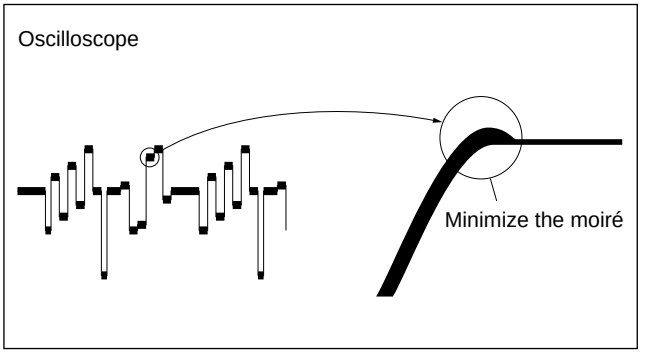
3. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP501/DM-89(F-4), AC 1 V/DIV
   GND: E501/DM-89(E-3)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
4. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV502/DM-89(E-3)
   Specification: Maximize the level difference A. (Minimize the fc.)



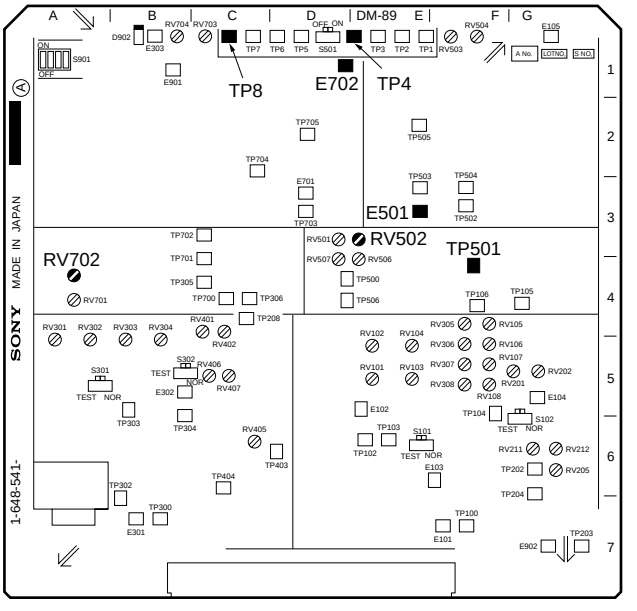
5. Stop the playback of the alignment tape.

C adjustment

6. Connect and set the oscilloscope as follows:
   CH-1: TP8/DM-89(C-1), AC 200 mV/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
7. During play back the alignment tape in PLAY mode, adjust the moiré of specified part on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV702/DM-89(A-4)
   Specification: Minimize the moiré of specified part.



8. Stop the playback of the alignment tape.



DM-89 Board (Side A)

5-2-12. PB Frequency Response Adjustment (Analog Betacam)

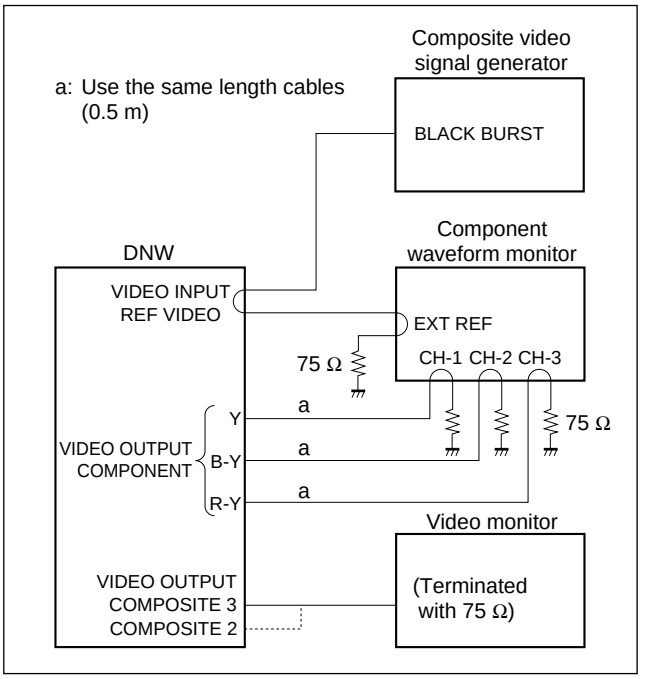
Prepare the following alignment tapes to perform this adjustment.

DNW-A75: CR5-1B and CR5-2A
(for NTSC analog Betacam)

DNW-A75P : CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment :
Analog composite signal generator
Analog component waveform monitor

1. Connect the equipment as follows :



2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A32 : DM VR 1.
4. To perform the tape operation, press the SET button once.

METAL Y adjustment

5. Watch the Y output signal on the analog component waveform monitor.

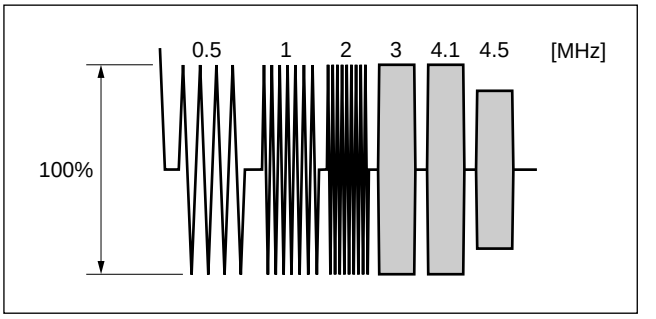
   Note

   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
6. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A75) / 2T BAR (DNW-A75P) .
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
7. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 6
8. To operate the maintenance mode, press the MENU button once.
9. Adjust the level at 4.1 MHz (DNW-A75) / 5 MHz (DNW-A75P).
   PB portion: The same as step 6
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
   Specification (A and B channels):
   See the table below.
10. To perform the tape operation, press the SET button once.
11. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 6
    Specification (A and B channels):
    See the table below.

12. Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
13. During play back the alignment tape in PLAY mode, check the playback picture on the video monitor.
    PB portion: The same as step 6
    Specification: It has not flicker.
14. Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

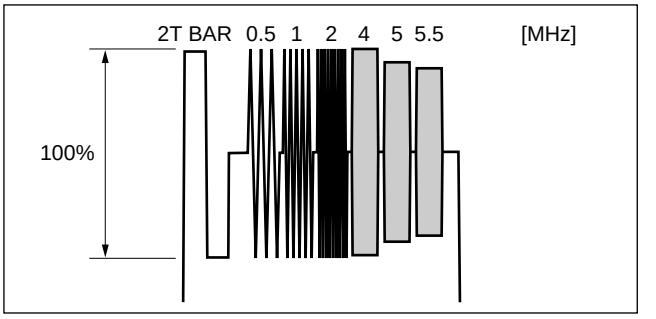
Specifications (METAL Y) for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)
4.1 MHz	Adjust: 94% (100 to 90%) {$-0.5\ ^{+0.5}_{-0.4}$ dB}
1 MHz 2 MHz 3 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check: 80% (106 to 63%) {$-2.0\ ^{+2.5}_{-2.0}$ dB}



Specifications (METAL Y) for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 2T BAR is 100% {0 dB}.)
5 MHz	Adjust: 91% (96 to 87%) {-0.8 ± 0.4 dB}
0.5 MHz 1 MHz 2 MHz 4 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check: 84% (106 to 63%) {$-1.5\ ^{+2.0}_{-2.5}$ dB}



METAL C adjustment

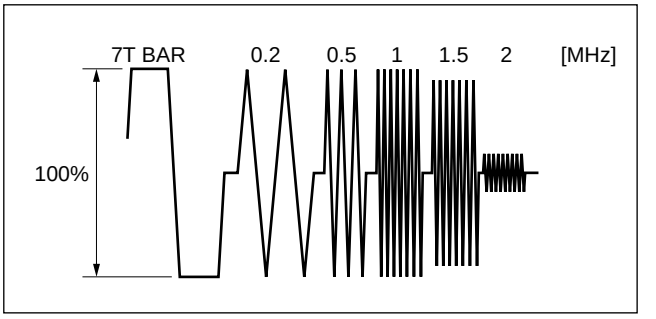
15. Watch the R-Y output signal on the analog component waveform monitor.

    Note

    As the R-Y(B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
16. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A75) / 8T BAR (DNW-A75P).
    PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
    This measured level is reference level 100% (0 dB).
17. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
    PB portion: The same as step 16
18. To operate the maintenance mode, press the MENU button once.
19. Adjust the level at 1 MHz (DNW-A75) / 1.5 MHz (DNW-A75P).
    PB portion: The same as step 16
    Adj. points:
    A channel: A32 : DM VR 1 : EQ1 METAL-C-A
    B channel: A32 : DM VR 1 : EQ1 METAL-C-B
    Specifications (A and B channels):
    See the table below.
20. To perform the tape operation, press the SET button once.
21. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 16
    Specifications (A and B channels):
    See the table below.
22. Watch the B-Y output signal on the component waveform monitor.
23. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
24. Eject the alignment tape.

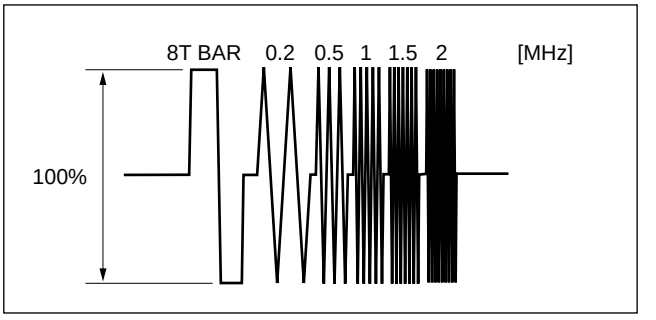
Specifications (METAL C) for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)
1 MHz	Adjust: 94% (100 to 89%) {−0.5 ±0.5 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications (METAL C) for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 8T BAR is 100% {0 dB}.)
1.5 MHz	Adjust: 93% (102 to 85%) {−0.6 ±0.8 dB}
0.2 MHz 0.5 MHz 1 MHz	Check: 100% (106 to 71%) {0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



OXIDE Y adjustment

25. Watch the Y output signal on the analog component waveform monitor.

    Note

    As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
26. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A75) / 2T BAR (DNW-A75P).
    PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
    This measured level is reference level 100% (0 dB).
27. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
    PB portion: The same as step 26
28. To operate the maintenance mode, press the MENU button once.
29. Adjust the level at 2 MHz (DNW-A75) / 3 MHz (DNW-A75P).
    PB portion: The same as step 26
    Adj. points:
    A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
    B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B
    Specifications (A and B channels):
    See the table below.
30. To perform the tape operation, press the SET button once.
31. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 26
    Specifications (A and B channels):
    See the table below.

32. During play back the alignment tape in PLAY mode, check the output level difference between A and B channels at high frequency (4.5 MHz) part.
    PB portion: The same as step 26
    Specification: It is not noticeable.

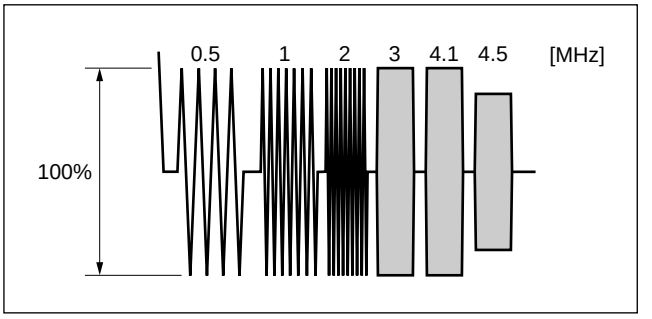
    Note

    If the output level difference of A and B channels at 4.5 MHz part is noticeable, change the data of “SUB OXIDE-Y-A” or “SUB OXIDE-Y-B” in A34 : DM VR 3 as following steps (1) to (8).

(1) To operate the maintenance mode, press the MENU button once.
(2) To exit A32 : DM VR 1, press the MENU button once.
(3) Enter A34 : DM VR 3.
(4) Change the data of “SUB OXIDE-Y-A” (A channel side), and judge a lower level channel.

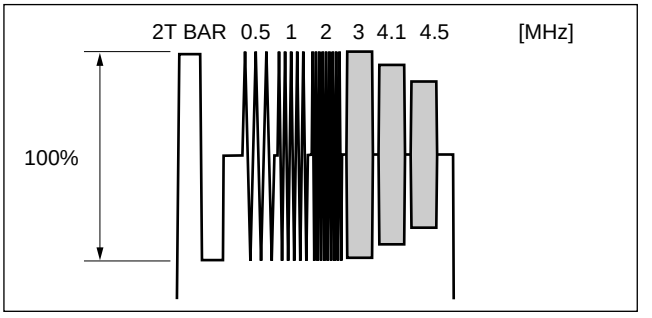
Specifications (OXIDE Y) for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)
2 MHz	Adjust: 100% (104 to 95%) {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check: 89% (106 to 50%) {–1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



Specifications (OXIDE Y) for DNW-A75P

Frequency	Specification for DNW-A75P (Level at 2T BAR is 100% {0 dB}.)
3 MHz	Adjust: 89% (100 to 79%) {–1.0 ±1.0 dB}
0.5 MHz 1 MHz, 2 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



(5) If the B channel side is lower: Return the data of “SUB OXIDE-Y-A” to the former data, then adjust (add to the data value) “SUB OXIDE-Y-B” until the level at 4.5 MHz of B channel is equal to the level at 4.5 MHz of A channel.
    If the A channel side is lower: Adjust (add to the data value) “SUB OXIDE-Y-A” until the level at 4.5 MHz of A channel is equal to the level at 4.5 MHz of B channel.
(6) To exit A34 : DM VR 3, press the MENU button once.
(7) Enter A32 : DM VR 1.
(8) To perform the tape operation, press the SET button once.

OXIDE C adjustment

33. Watch the R-Y output signal at the analog component waveform monitor.

    Note

    As the R-Y (B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
34. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A75) / 8T BAR (DNW-A75P).

    PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS

    This measured level is reference level 100% (0 dB).
35. Restart the playback of alignment tape from the top of PB portion in PLAY mode.

    PB portion: The same as step 34
36. To operate the maintenance mode, press the MENU button once.
37. Adjust the level at 1 MHz.

    PB portion: The same as step 34

    Adj. points:

    A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A

    B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B

    Specifications (A and B channels):

    See the table below.
38. To perform the tape operation, press the SET button once.
39. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.

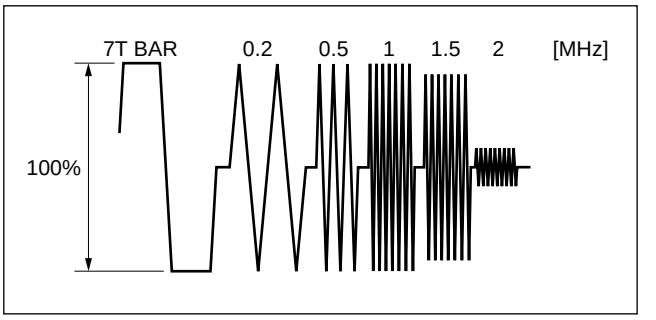
    PB portion: The same as step 34

    Specifications (A and B channels):

    See the table below.
40. Watch the B-Y output signal on the component waveform monitor.
41. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
42. Eject the alignment tape.
43. To operate the maintenance mode, press the MENU button once.
44. To exit A32 : DM VR 1, press the MENU button once.

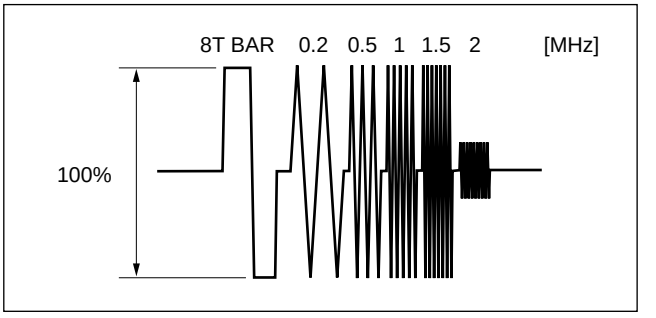
Specifications (OXIDE C) for DNW-A75

Frequency	Specification for DNW-A75 (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{−0.5 ±0.5 dB}
0.2 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check: 95% (106 to 71%)	{−0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications (OXIDE C) for DNW-A75P

Frequency	Specification for DNW-A75P (level at 8T BAR is 100% {0 dB}.)	
1 MHz	Adjust: 94% (102 to 86%)	{−0.5 ±0.8 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 84% (106 to 71%)	{−1.5 $^{+2.0}_{-1.5}$ dB}



Data save (Store the adjusted data)

45. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
46. To exit the maintenance mode, press the MENU button four times.

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5-2-13. DM RF Output Level Readjustment (Analog Betacam)

Readjust the DM RF output level referring to Section 5-2-8 again.

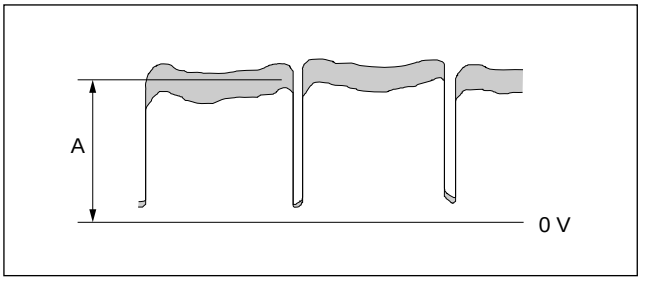
5-2-14. RF Envelope Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.
DNW-A75: CR5-1B (for NTSC analog Betacam)
DNW-A75P : CR5-1B PS (for PAL analog Betacam)

Measuring equipment : Oscilloscope

Y adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC 500 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 5 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV205/DM-89(G-6)
   Specification: A = 2.0 ±0.2 V dc

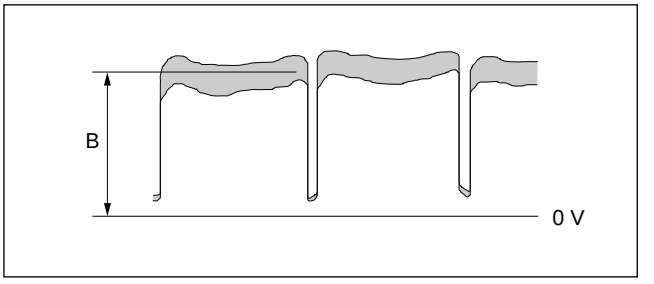


3. Stop the playback of the alignment tape.

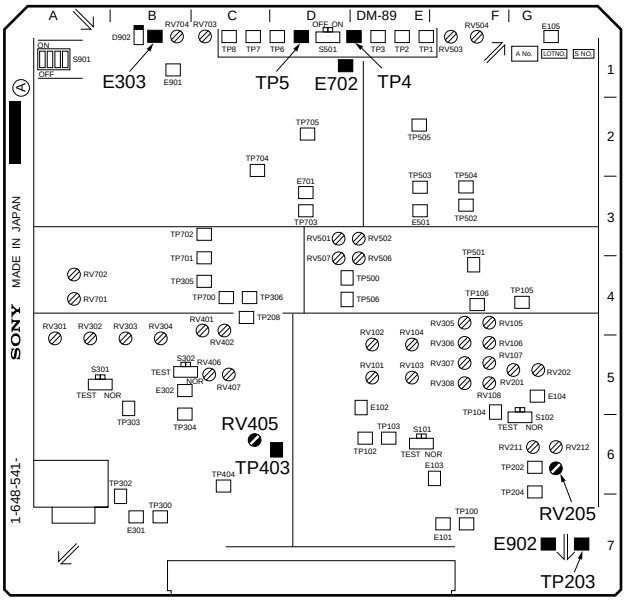
C adjustment

4. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6)
   GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1)
   GND: E702/DM-89(D-1)

5. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV405/DM-89(C-6)
   Specification: B = 2.0 ±0.2 V dc



6. Stop the playback of the alignment tape.



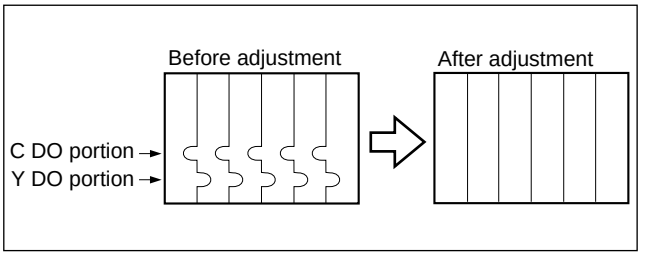
DM-89 Board (Side A)

5-2-15. Impact Error Offset Adjustment (Analog Betacam)

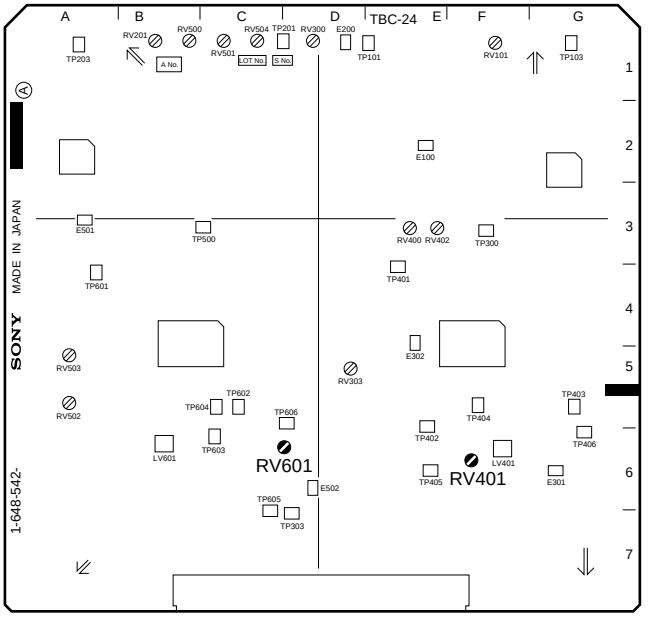
Prepare the following alignment tape.
DNW-A75: CR5-1B (for NTSC analog Betacam)
DNW-A75P : CR5-1B PS (for PAL analog Betacam)

Measuring equipment : Video monitor

1. Turn off the power.
2. Stop the exteuion of the DM-89 board.
3. Extend the TBC-24 board with an extension board EX-377 and an extension harness (14P).
4. Turn on the power.
5. Set the CHARACTER switch to OFF.
6. Start the playback of alignment tape in PLAY mode.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
7. Check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   Adj. points: Y DO: ⊘RV401/TBC-24(F-6)
   C DO: ⊘RV601/TBC-24(D-6)
   Specification: No dorp-out (on C DO and Y DO)



8. Stop the playback of the alignment tape.
9. Return the CHARACTER switch to ON.
10. Turn off the power.
11. Stop the extension of the TBC-24 board.
12. Turn on the power.



TBC-24 Board (Side A)

5-2-16. TBC Y/C Delay Adjustment (Analog Betacam)

Note

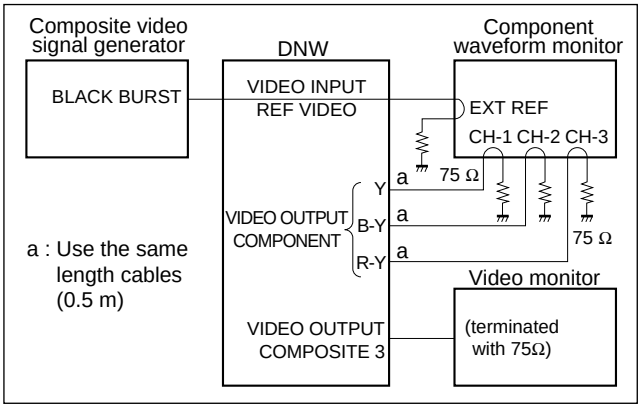
Be sure to perform this adjustment without using the extension board.

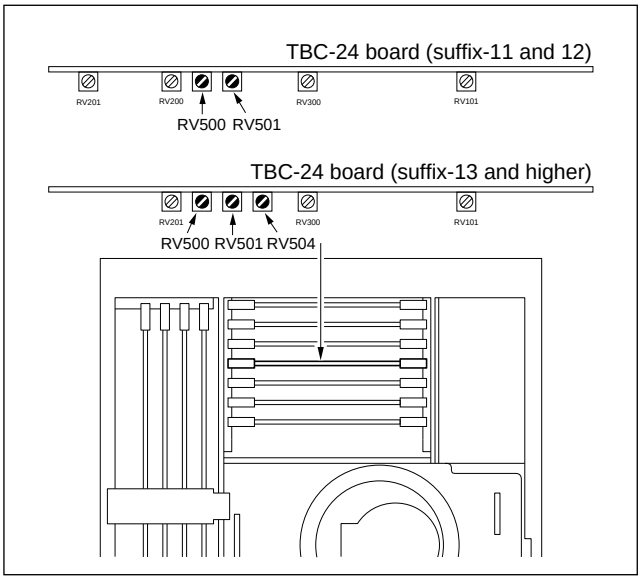
Prepare the following alignment tapes to perform this adjustment.

DNW-A75: CR5-1B and CR5-2A
(for NTSC analog Betacam)
DNW-A75P : CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment :
Analog composite signal generator
Analog component waveform monitor

1. Connect the equipment as follows :





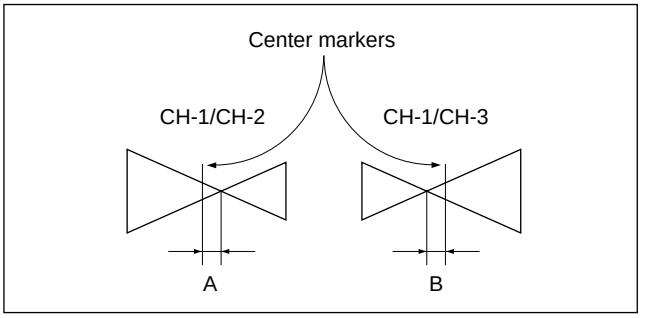
RV500, RV501, and RV504 on TBC-24 Board

METAL adjustment

2. Set the component waveform monitor to BOWTIE mode.
3. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
4. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns

Note

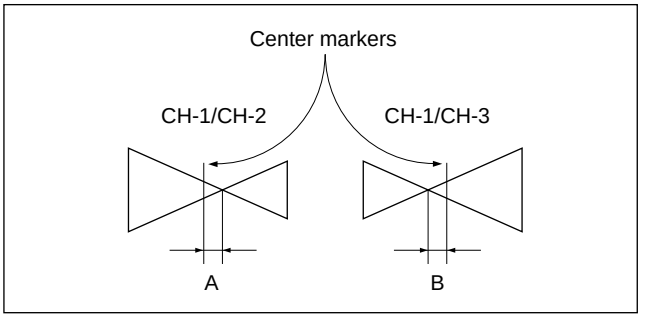
As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.



5. Stop the playback of the alignment tape, then eject it.

OXIDE adjustment

6. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (6:00 to 9:00) of CR5-2A / CR5-2A PS
7. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV501/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns



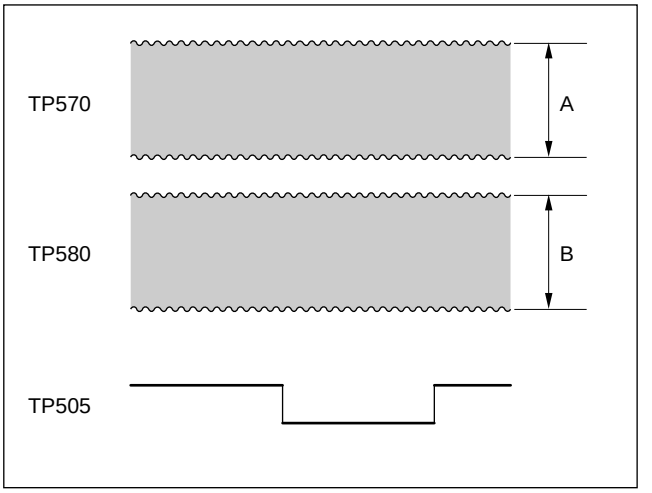
8. Stop the playback of the alignment tape, then eject it.

5-2-17. AFM RF Level Adjustment (Betacam SP)

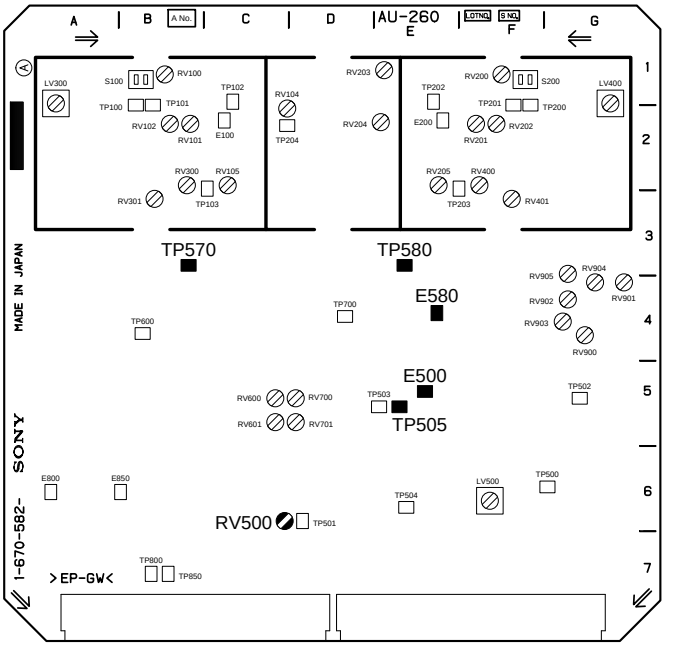
Prepare the following alignment tape to perform this adjustment.
DNW-A75: CR5-1B (for NTSC analog Betacam)
DNW-A75P : CR5-1B PS (for PAL analog Betacam)

Measuring equipment : Oscilloscope

1. Turn off the power.
2. Extend the AU-260 board with extension board EX-556.
3. Turn on the power.
4. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP570/AU-260(B-3) ,
   GND: E580/AU260(E-4)
   CH-2: TP580/AU-260(E-3) ,
   GND: E500/AU260(E-5)
   TRIG: TP505/AU-260(E-5) ,
   GND: E500/AU260(E-5)
   TIME: 5 ms/DIV
5. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the alignment tape CR5-1B or CR5-1B PS in PLAY mode.
6. Check the RF levels of waveforms on the oscilloscope. If the speification is not satisfied, adjustment.
   Adj. point: ⊘RV500/AU-260(C-6)
   Specifications: A = 450 ±100 mV p-p
   B = 450 ±100 mV p-p



7. Stop the playback of the alignment tape, then eject it.



AU-260 Board (Side A)

5-2-18. DT Offset Level Adjustment (Another Video System) (Analog Betacam)

Prepare the following alignment tape to perform this adjustment.

DNW-A75 : CR5-1B PS or CR5-2A PS
(for PAL analog system)
DNW-A75P : CR5-1B or CR5-2A
(for NTSC analog system)

Offset level adjustment

1. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT, and switch the video system of the composite video momitor.
   DNW-A75 : 625/50 system
   DNW-A75P : 525 60 system
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
2. Insert the alignment tape, then advances it to the following time code.
   CR5-1B/CR5-1B PS : Time code 00:14:00:00
   CR5-2A/CR5-2A PS : Time code 00:00:00:00
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
5. Insert the alignment tape again.
6. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
7. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

9. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
10. To exit the maintenance mode, press the MENU button five times.
    - The alignment tape is ejected automatically.

Drive gain adjustment

11. Insert the alignment tape, then advances it to the following time code.
    CR5-1B / CR5-1B PS : Time code 00:14:00:00
    CR5-2A / CR5-2A PS : Time code 00:00:00:00
12. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
13. Enter A031 : DRIVE GAIN.
    - The alignment tape is ejected on the way to menu A031.
14. Insert the alignment tape again.
15. Press the SET button.
    - Message “Set VARIABLE × 3” is displayed on the video monitor.
16. Press the VAR button.
    - The VAR button is lit, and the search dial is entered the VARIABLE mode.
17. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
    - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
    - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
18. Press the JOG button.
    - The JOG button is lit, and the search dial is entered the JOG mode.
19. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

20. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
21. To exit the maintenance mode, press the MENU button five times.
    - The alignment tape is ejected automatically.

Perfection

22. Switch the video system of the unit using the ITEM-013, and switch the video system of the video monitor.
    DNW-A75 : 525/60 system
    DNW-A75P : 625/50 system
23. Return the settings of the setup extend menus ITEM-709 and ITEM-713 to the customer setting.
    (Refer to Section 5-2-2.)

5-3. Electrical Adjustment after Replacing the AT Head

5-3-1. Adjustment Overview

Perform this section when the AT head was replaced.

For adjustment items and its order, refer to “Adjustment Items” on next page.

Tools List

To perform the electrical adjustments, the following equipment and fixtures are required.

- Audio signal generator: TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent

  Note

  The audio analyzer should be filtered through 80 kHz LPF throughout adjustment.
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Band-pass filter (1 kHz)
- Time code generator: SONY BVG-1600 (for NTSC) / BVG-1600PS (for PAL) or equivalent
- Time code reader: SONY BVG-1500 (for NTSC) / BVG-1500PS (for PAL) or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip
- Alignment tapes

  For DNW-A75: CR8-1A (Part No. 8-960-097-45) and
  SR5-1 (Part No. 8-960-075-01)

  For DNW-A75P: CR8-1A PS (Part No. 8-960-098-45),
  CR8-1B PS (Part No. 8-960-096-86), and
  SR5-1P (Part No. 8-960-075-51)
- Recorded SP tape: BCT-SP series (Betacam SP cassette: Sony’s standard products)

  Note

  Be sure to prepare a Betacam SP cassette tape that recorded the no signal to the LAU tracks using a Betacam SP videocassette recorder in advance.
- Recording tape: BCT-SX series (Betacam SX cassette: Sony’s standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

No.	Item	Adjustment point		Test point
5-3-2	Preparation			
5-3-3	LAU PB frequency response adjustment (Audio head dumping adjustment)			
	OXIDE	CH1	⊘RV101/AU-260(B-2) ⊘RV100/AU-260(B-1) [S100/AU-260(B-1)]	AUDIO OUTPUT CH1
		CH2	⊘RV201/AU-260(F-2) ⊘RV200/AU-260(F-1) [S200/AU-260(F-1)]	AUDIO OUTPUT CH2
	METAL (DNW-A75P only)	CH1	⊘RV102/AU-260(B-2)	AUDIO OUTPUT CH1
		CH2	⊘RV202/AU-260(F-2)	AUDIO OUTPUT CH2
5-3-4	LAU Dolby level adjustment	CH1	⊘RV204/AU-260(C-2)	TP103/AU-260(C-2)
		CH2	⊘RV204/AU-260(E-2)	TP203/AU-260(F-2)
5-3-5	LAU PB level Adjustment	CH1	⊘RV105/AU-260(C-2)	AUDIO OUTPUT CH1
		CH2	⊘RV205/AU-260(E-2)	AUDIO OUTPUT CH2
5-3-6	LAU PB phase adjustment		⊘RV203/AU-260(E-1)	AUDIO OUTPUT CH1/CH2
5-2-7	TC insert cross-talk adjustment	CH1	⊘RV901/AU-260(G-4) ⊘RV902/AU-260(G-4)	AUDIO OUTPUT CH1
		CH2	⊘RV904/AU-260(G-4) ⊘RV905/AU-260(G-4)	AUDIO OUTPUT CH2
5-3-8	LTC Erasure current adjustment		⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)
5-3-9	LTC PB level check		check	TP102/TC-102(A-2)
5-3-10	LTC OA check		check	TP100/TC-102(A-3), TP101/TC-102(A-2)
5-3-11	LTC Erase ratio check		check	TP102/TC-102(A-2)

5-3-2. Common Preparation

Perform the settings (shorting plugs, control panels, setup menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the audio system alignment.

1. Setting the shorting plugs on APR-40 board

Reset the shorting plugs of APR-40 board to the factory settings.

Note

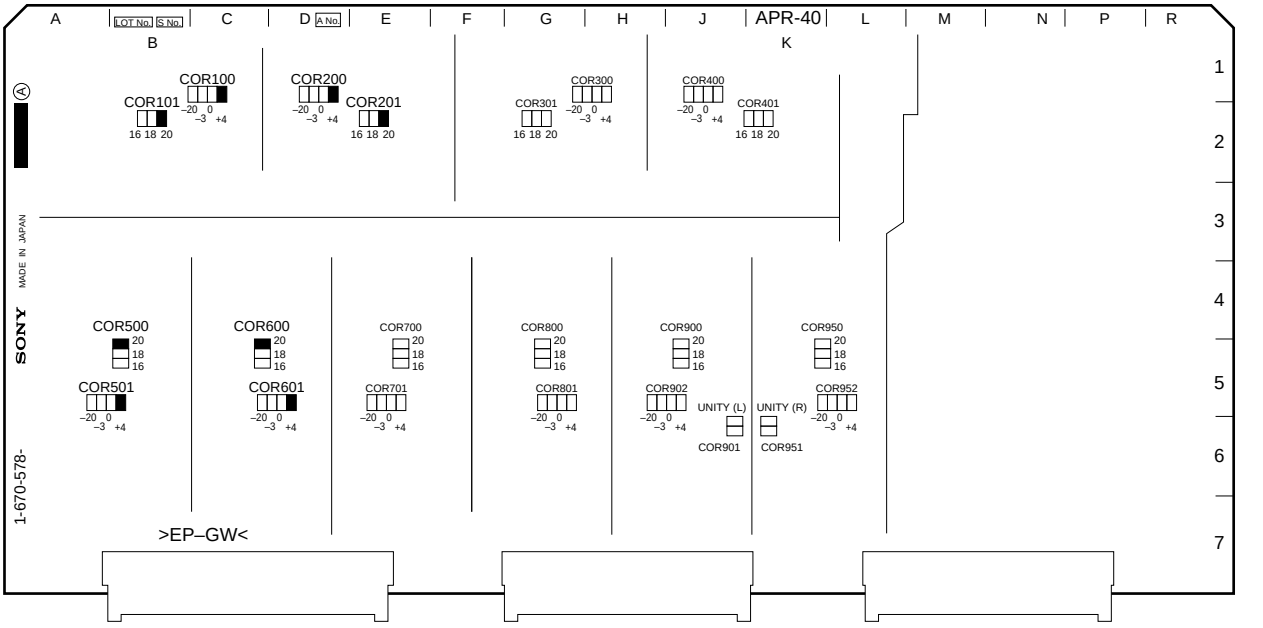
Turn off the power before removing the APR-40 board and changing the shorting plugs setting.

Ref. No. (Address)	Item	Customer setting	Factory setting
COR100 (C-1)	Analog audio CH1 input level	_____	⇨ +4
COR101 (B-2)	Analog audio CH1 input headroom	_____	⇨ 20
COR200 (D-1)	Analog audio CH2 input level	_____	⇨ +4
COR201 (E-2)	Analog audio CH2 input headroom	_____	⇨ 20
COR500 (B-5)	Analog audio CH1 output headroom	_____	⇨ 20
COR501 (B-5)	Analog audio CH1 output level	_____	⇨ +4
COR600 (C-5)	Analog audio CH2 output headroom	_____	⇨ 20
COR601 (D-5)	Analog audio CH2 output level	_____	⇨ +4

2. Extend the AU-260 board with an extension board EX-556.

Note

Perform under the power off.



APR-40 Board (Side A)

3. Others settings (except the menu setting)

Location	Item		Customer setting	Setting at adjustment
SS-83 board	DIP switch S1100 (M-1)	No. 1	_____	⇨ ON (Set to the up position)
	Note Set to ON to treat the extended menu of the setup menu.			
Upper control panel	PB (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	TC	LTC/AUTO/VISC	_____	⇨ LTC
	TC GENERATOR	INT/EXT	_____	⇨ INT
		PRESET/REGEN	_____	⇨ REGEN
		FREE/RUN REC RUN	_____	⇨ REC RUN
	REMOTE	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	CHARACTER switch		_____	⇨ ON
	DOLBY NR switch		_____	⇨ OFF
	REC INHIBIT switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

4. Video system check

Be sure to adjust in the following system.
DNW-A75: 525/60 system
DNW-A75P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

5. Setup extended menu setting

Item	Customer setting	Setting at adjustment
817 : EMPHASIS	_____	⇨ OFF
F01 : AUDIO NR IN SP MODE (DNW-A75P only)	ON	⇨ SW

Note

- To display the ITEM-F00 series, turn the search dial while pressing the PLAY button.
- After adjustments are completed, return the ITEM-F01 to “ON”.

5-3-3. LAU PB Frequency Response Adjustment

Prepare the following alignment tape(s) to perform this adjustment.
DNW-A75: CR8-1A
DNW-A75P: CR8-1A PS and CR8-1B PS

Measuring equipment: Audio analyzer

1. Set the audio analyzer as follows:
   Function mode: dB RATIO
   Input filter: 80 kHz LPF

CH1 adjustment (OXIDE)

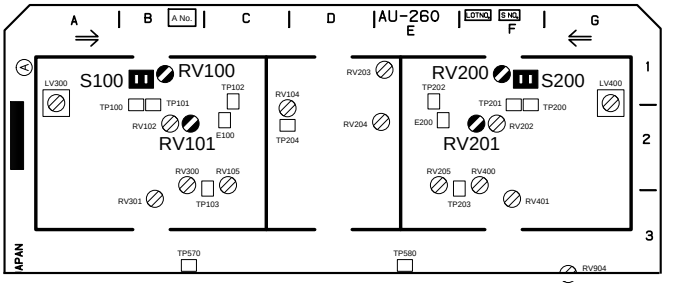
2. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
3. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS alignment tape in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
4. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.
   Note
   If the specification for RV100 adjustment is not satisfied, readjust after changing the setting of S100(B-1) on the AU-260 board.

CH2 adjustment (OXIDE)

5. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
6. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
7. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.
   Note
   If the specification for RV200 adjustment is not satisfied, readjust after changing the setting of S200(F-1) on the AU-260 board.

	Specification [dB]		
Playback portion	**DNW-A75**	**DNW-A75P**	**Adjustment point**
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).		—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	C.V. ±0.4	CH-1: ⊘RV101/AU-260 (B-2) CH-2: ⊘RV201/AU-260 (F-2)
7:00 to 7:25 (10 kHz)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{+1.0}_{-1.7}$	CH-1:⊘RV100/AU-260 (B-1) CH-2:⊘RV200/AU-260 (F-1)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

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CH1 adjustment (METAL) for DNW-A75P only

8. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
9. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the alignment tape CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
10. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

CH2 adjustment (METAL) for DNW-A75P only

11. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
12. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
    This measured audio level is a reference level (0 dB).
13. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

Playback portion	Specification [dB]	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).	—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. ±0.5	CH-1: ◓RV102/AU-260(B-2) CH-2: ◓RV202/AU-260(F-2)

The correction values (C.V.) are given on the label of the alignment tape.

5-3-4. LAU Dolby Level Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A75: CR8-1A
DNW-A75P: CR8-1B PS

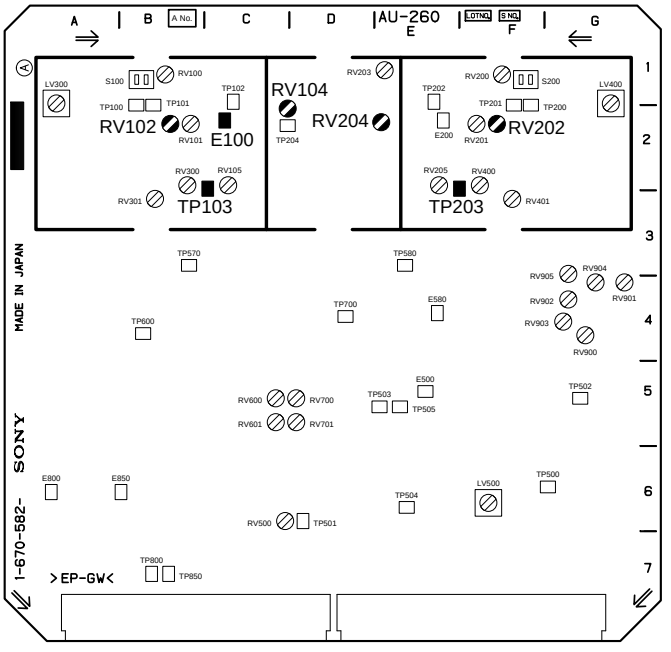
Measuring equipment: Audio level meter

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
3. Adjust the audio level on the audio level meter.
   Adj. point: ◓RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E100/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ◓RV204/AU-260(E-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)



AU-260 Board (Side A)

5-3-5. LAU PB Level Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A75: CR8-1A
DNW-A75P: CR8-1B PS

Measuring equipment: Audio analyzer

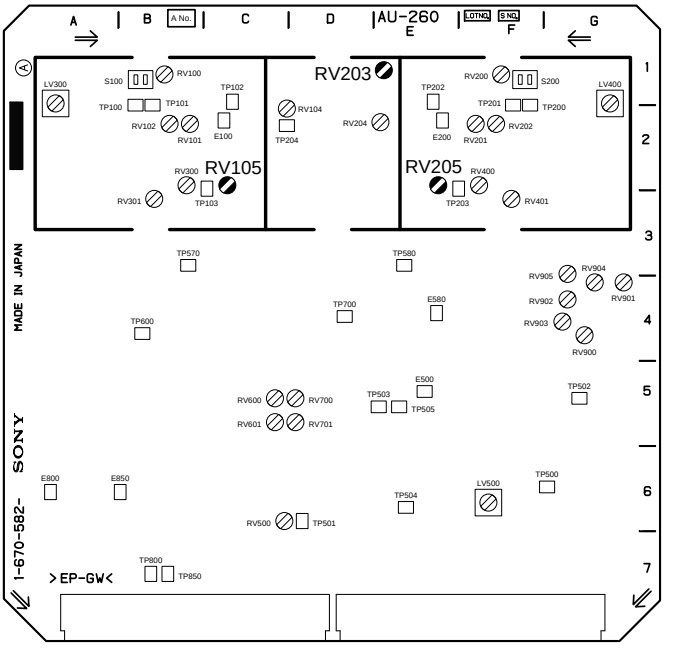
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV205/AU-260(E-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV105/AU-260(C-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

5-3-6. LAU PB Phase Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A75: CR8-1A
DNW-A75P: CR8-1B PS

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   X-Y mode
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector
   GND: Pin 1 (G) of it, AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector
   GND: Pin 1 (G) of it, AC

   Note

   An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors.
   Prepare two XLR-to-pigtail cables for this adjustment. And connect the XLR plug end of the cable to above-mentioned connectors and the pigtailed end to the oscilloscope. The cables for CH-1 and CH-2 shall be the same in length and same wire color on the pigtailed end.
2. For DNW-A75: Play back the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A in PLAY mode.
   For DNW-A75P: Play back the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS in PLAY mode.
3. Watch the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adj. point: ⊘RV203/AU-260(E-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 1.)

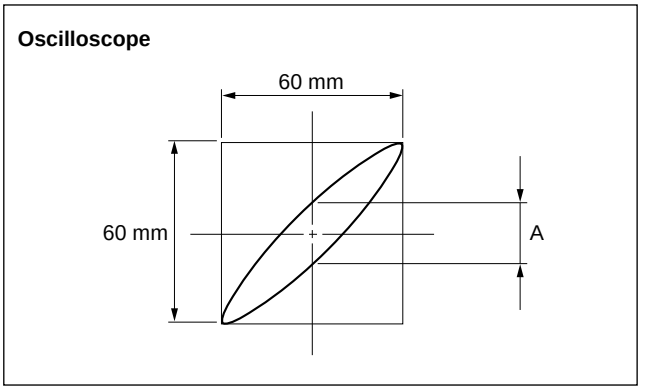


Figure 1. Lissajous Waveform of LAU PB Phase Adjustment

5-3-7. TC Insert Cross-talk Adjustment

Measuring equipment: Audio analyzer

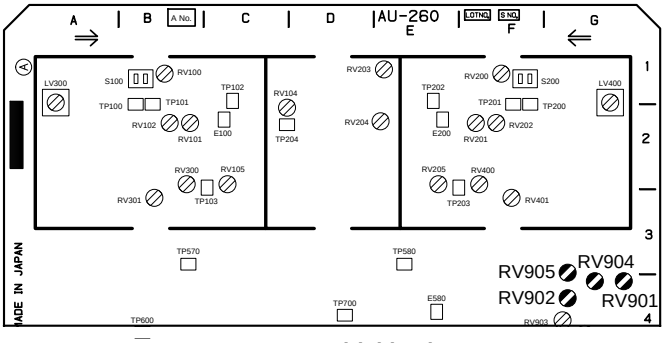
1. Open the AUDIO INPUT CH1 and CH2 connectors.
2. Insert the Betacam SP cassette tape that recorded the no signal to the LAU tracks.
3. Set the audio analyzer as follows:
   Function mode: LEVEL
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Press the INSERT TIME CODE button on the lower control panel.
6. Press the PLAY button while pressing the EDIT button.
7. Adjust the cross-talk level on the audio analyzer.
   (Alternately adjust the following adj. points.)
   Adj. points: ⊘RV901/AU-260(G-4)
   ⊘RV902/AU-260(G-4)
   Specification: Minimize
   (The level should be less than −18 dBu)
8. Stop the recording.

CH2 adjustment

9. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
10. Press the INSERT TIME CODE button on the lower control panel.
11. Press the PLAY button while pressing the EDIT button.
12. Adjust the cross-talk level on the audio analyzer.
    (Alternately adjust the following adj. points.)
    Adj. points: ⊘RV904/AU-260(G-4)
    ⊘RV905/AU-260(G-4)
    Specification: Minimize
    (The level should be less than −18 dBu)
13. Stop the recording, then eject the cassette tape.



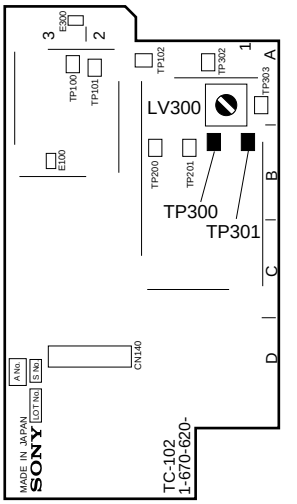
AU-260 Board (Side A)

5-3-8. LTC Erasure Current Adjustment

Prepare the recording tape to perform this adjustment.

Measuring equipment:
Audio level meter (V rms measurement mode)
Oscilloscope

1. Connect the audio level meter to TP301 (B-1) on the TC-102 board.
   GND: TP300/TC-102 (B-1)
2. Insert the recording tape, then put into the recording mode.
3. Check the level on the audio level meter.
   Adj. point: ⊘LV300/TC-102 (A-1)
   Specification: Maximum (110 mV rms or more: OK)
4. Disconnect the audio level meter and connect the oscilloscope to the same test point.
5. Check that no distortion is watched on the waveform.
6. Eject the recording tape.



TC-102 Board (Side A)

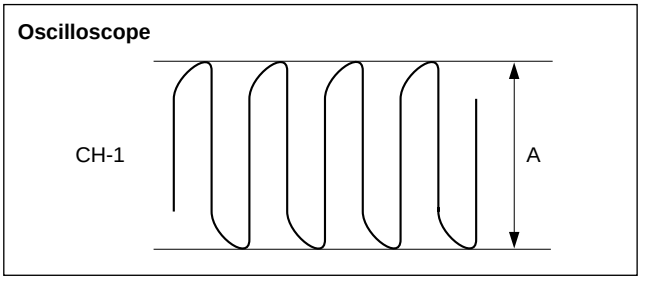
5-3-9. LTC PB Level Check

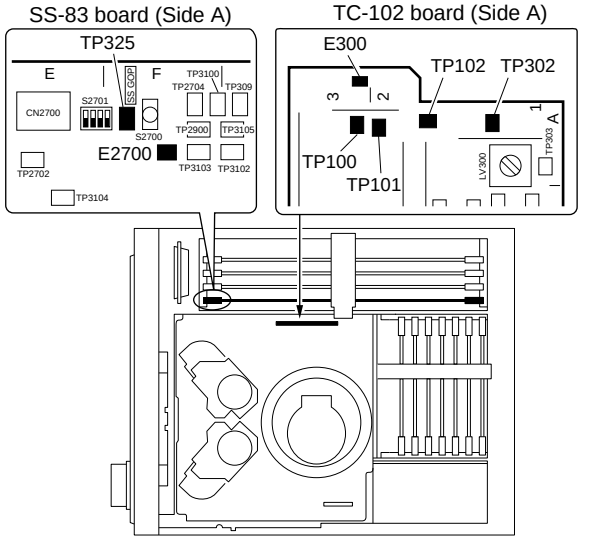
Prepare the following alignment tape to perform this adjustment.
DNW-A75: SR5-1
DNW-A75P: SR5-1P

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   CH-1: TP102/TC-102 (A-2),
   GND: E300/TC-102 (A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83 (A-1), GND: E2700/SS-83 (A-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in following PB modes, check the level on the oscilloscope in each PB mode.
   PB modes: PLAY, REW,
   SHUTTLE (−5 times speed),
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)

If the above specification is not satisfied, perform "4-1. Tape Path Adjustment" again.



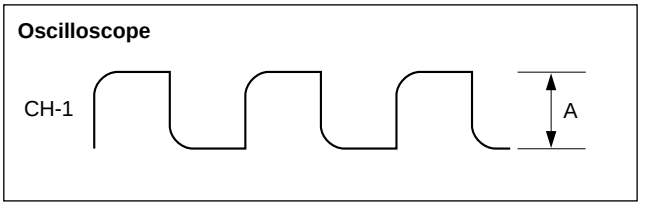


5-3-10. LTC OA Check

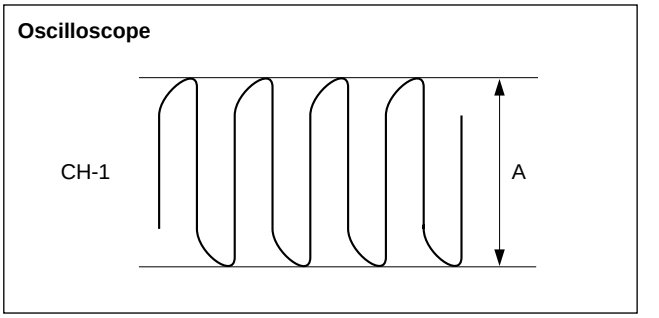
Prepare the recording tape to perform this adjustment.

Measuring equipment: Oscilloscope
Time code generator
Time code reader

1. Connect the output of the time code generator to TIME CODE IN connector of the DNW.
2. Connect and set the oscilloscope as follows:
   CH-1: TP100/TC-102 (A-2),
   GND: TP101/TC-102 (A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83 (F-1), GND: E2700/SS-83 (F-1)
   TIME: 100 µs/DIV
3. Insert the recording tape.
4. Check the level in recording mode.
   Specification: 60 ±5 mV p-p



5. Connect the input of the time code reader to TIME CODE OUT connector of the DNW.
6. Change the connection of oscilloscope as follows:
   CH-1: TP102/TC-102 (A-2)
   GND: E300/TC-102 (A-3)
7. During play back the recorded portion at step 4 in PLAY mode, check that the time code can be read on the time code reader.
8. During play back the recorded portion at step 4 in following PB modes, check each level on the oscilloscope.
   PB modes: PLAY, REW,
   SHUTTLE (−5 times speed),
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)



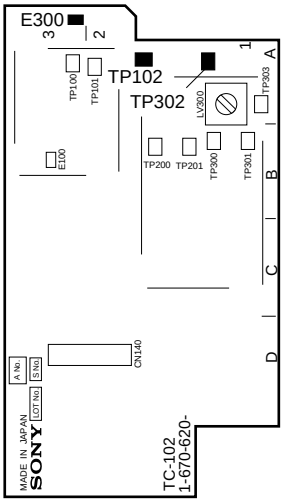
5-3-11. LTC Erase Ratio Check

Prepare the recording tape to perform this adjustment.

Measuring equipment:

Audio signal generator
Audio level meter (dB ratio measurement mode)
Band-pass filter (1 kHz)

1. Set following selectors of TC GENERATOR selection on the upper control panel.
   INT/EXT select: EXT
   PRESET/REGEN select: PRESET
2. Feed the audio signal (1 kHz, +7 dBu) from the audio signal generator to TIME CODE IN connector of DNW. (0 dBu ≒ 0.775 V rms)
3. Insert the recording tape, then record for 30 seconds. (Record the audio signal to the time code track.)
4. Short-circuit TP302/TC-102 (A-1) and E300/TC-102 (A-3) with a shorting clip.
5. Rewind the recorded portion by 15 seconds and record again. (Record the no signal to the time code track.)
6. Disconnect the shorting clip.
7. Connect the audio level meter through a 1 kHz band-pass filter to TP102/TC-102 (A-2).
   GND: E300/TC-102 (A-3)
8. During play back the audio-signal-recorded portion in PLAY mode, measure the PB level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
9. During play back the no-signal-recorded portion in PLAY mode, check the PB level on the audio analyzer.
   Specification: −40 dB or less
   (Regard a level of the audio-signal-recorded portion as 0 dB.)



TC-102 Board (Side A)



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